NEDA Quarterly

North East Digital Association

Devoted to Packet Networking in the North East

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From the Editor

I recently had the pleasure of visiting a site owned and operated by the VE2RM radio club in Rigaud Quebec (pronounced REE-GO). VE2BMQ, Burt and VE2EK, Dino gave me a tour and talked with N2MGI, Matt, and I extensively about technique, promotion, documentation and about the people involved in the project.

The site at Rigaud Mountain is a VHF repeater operator's dream. The building, tower and property are ideal for repeater and packet work and are owned by the club. They lease tower space and a lesser building to commercial vendors to help pay for the site. Tower is 130 feet of first class hardware. It looks very commercial but except for the lowest antennas it's all ham. Even the tower lights flash in Morse Code.

Now, while I'm usually pretty strict about talking about vaporware (any-day-now projects) I was convinced by the progress that Burt and associates have made that they are definitely not fooling around. Burt is a meticulous machinist and technician and has constructed some very impressive pieces of equipment. Dino has come up with some nice drawings and presentation materials for the packet project and some excellent support materials for TheNET tinkerers. Dino supplied me with copies to photocopy into the Quarterly and you'll find them elsewhere in this issue.

The project that Burt outlined to me involves tying together existing servers and TheNET nodes through a UHF repeater at the Rigaud site. He showed me the repeater hardware they are going to be used. For preliminary testing they've got a non-duplex radio running. This allows the servers to get on line now while Burt finishes up the repeater. The project involves getting one additional node site on line at Moose Creek Ontario. That site would tie Potsdam, Canton and Ogdensburg into Rigaud and potentially tie into Ottawa as well.

Having seen the existing literature that Dino had created I suggested that he duplicated his map into three versions: a *this exists now* version; a *current projects* version; and a *what we really want* version. The map that is printed in this Quarterly is a compendium of what regional packeteers have told Dino about the near future.

I'm looking forward to massive progress in the northern New York, Ottawa and Montreal region. This is especially true as I live very near the Potsdam node!

I'm looking for article submissions for the Summer Quarterly! Address all correspondence to me at 20 Clinton St. Potsdam NY 13676 or phone me at 315-268-6288. I have modem equipment so we can pass things over the phone as well. My Internet address is torbortc@clutx.clarkson.edu.

—KA2DEW
—NEDA Editor

Hexipus Boards are Shipping!

To get yours send #29.95 plus $4 shipping for complete kit or $22.95 plus $4 shipping for board and diodes only to the club POBox. Expect four weeks for delivery. The boards are easy to assemble and are now in use at many sites.

What is TCP/IP?

Transmission Control Protocol/Internet Protocol. TCP/IP defines a protocol suite. TCP/IP is a system of messages sent between computers, via radio (or telephone, or wire) that enable the computers to exchange data meaningfully. Where AX.25 is a protocol that defines how two TNCs can communicate, either directly or via digipeaters, TCP/IP is a protocol suite that defines how two computers can communicate, over wire line, telephone with modems, two or more TNCs, NET/ROM, TheNET, ROSE, etc. etc. TCP/IP is called a suite of protocols because it actually includes hundreds of different message types and response procedures for dozens of different purposes.

Defined in TCP/IP as commands (and separate protocols) there are TELNET, FTP, SMTP, FINGER, PING and others that are of direct use to the user.

TELNET establishes a real time two way interactive connection between a user at his own computer and another remote computer. This lets the user command the remote machine as if he were sitting at the keyboard of the remote machine. This is similar in effect to how an AX.25 user perceives TheNET and BBS operation.

FTP or File Transfer Protocol is a customized command set for getting or putting files on a remote computer from the user's computer. Files may contain non-text information. This is a key feature of TCP/IP for amateur packet radio.

SMTP or Simple Mail Transfer Protocol is a system for automatically routing multi-line messages from one

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Minutes of 2nd Quarter Board of Directors Meeting April 13 1991

The meeting was called to order by Rich, WB2JLR, as chairman at 10:20AM. The meeting was held at the Keene NH fire department. It will be noted at this time that Lindsay, NR1N who is one of the board members, was sitting at the back of the room and remained there throughout the meeting.

Rich reminded all present that the meeting was open to all voting members or to other people by invitation from a board member. Only the board members may vote on the issues as per the NEDA Constitution. Non members and non-voting members may join or upgrade during the first break.

Rich inquired as to rules governing the use of the building that the meeting was held in. Someone responded "Don't set any fires!". Dana asks if it is all right to shout "Theater" in a crowded fire hall? It was generally agreed that that was OK.

Attendees:

Dana Jonas	WA2WNI	E	NY
Rich Place	WB2JLR	W	NY
Linds Collins	NR1N	S	NH
Cal Stiles	W1JFP	S	NH
Jim Wzorek	K1MEA	W	MA
Kevin Wright	WA2VAM	C	NY
Cal Calvito	WA1WOK	S	NH
Chan Eddy	KA1OU	S	NH
Arny	N1BAC	S	NH
Bob Seger	WB2QBQ	E	NY
Bob Lafleur	NQ1C	W	MA
Russ Allister	WA1TLN	S	NH
Dave	N1FCC	C	MA
Fred Donaldson	N1EZD	C	MA
Dexter	KY1M	C	MA
Herb Salls	WB1DSW	S	NH
Michelle Wright	N2IDK	C	NY

Secretary's report:

WB2JLR moved that the minutes be accepted as published in the Winter Quarterly. WA2WNI seconded. Passed

Treasurer's report

Verbal Summary given at the meeting by Herb Salls, treasurer was asked to deliver a printed copy to the editor.

Herb remarks that membership is, as usual, on an increase.

So far only 10 members have failed to renew when their membership ran out.

Herb reports that 4 orders for Hexipus boards have come in.

NEPRA has paid $100 to renew their 'club' affiliation with NEDA.

Opening Balance	2787.15
Income	
Interest	47.62
Dues	1444.54
Hexipus Boards	188.80
Total Income	1680.96
Expenses	
Printing	645.79
Mailing	438.36
Hexipus Project	1052.54
Operating	95.00
Total Expenses	2231.69
Closing Balance 4/22/91	2236.42

BBS Committee report, Jim K1MEA

G8BPQ hooked to Hexipus

Jim reports that K1MEA, WB2JLR and WB1DSW have managed to make PC based servers which run MSYS or G8BPQ talk direct to the Hexipus using a pair of transistors to invert the control lines from the PC. This makes it possible to add ports to a server for the cost of a TNC, using only one serial port on the PC for N ports. Also this lets a node owner add a server to an existing node for the cost of a pair of transistors using one serial port on the server PC. Jim mentions that G8BPQ works much better with a TheNET TNC than with a KISS TNC.

WB4HFN DOSgate

Jim reports that WB4HFN is running a DOSgate available from KNGSTN on 145.05 and MTUNC on 223.58.

W1NY node back on line

W1NY is back up with a real node again but had to change his link to the BERK repeater from 25 watts omni to 5 watts with a 19 element beam due to the coordination mishap which caused the local ATV repeater to have overlapping spectrum with the WA1TPP BERK repeater. This solution seems to work.

WA1TPP MSYS

Herb WA1TPP is playing with MSYS at his node site and has recently upgraded to a version that will allow .cc files which might be useful to the club for handling NTECH/NBOD/

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NEDA Officers and Appointees

Board of Directors:

	Jim Wzorek	K1MEA
	Kevin Wright	WA2VAM
	Dana Jonas	WA2WNI
	Cal Stiles	W1JFP
	Linds Collins	NR1N
	Rich Place	WB2JLR

Appointees:

Chairman:	Cal Stiles	W1JFP
Vice Chair:	Rich Place	WB2JLR
Treasurer:	Herb Salls	WB1DSW
Membership:	Herb Salls	WB1DSW
Maps:	Cal Stiles	W1JFP
Editor:	Tadd Torborg	KA2DEW
Secretary:	Dana Jonas	WA2WNI

Board Member Alternates:

K1MEA:	Bob Lafleur	NQ1C
WA2VAM:		
WA2WNI:	Bob Seger	WB2QBQ
W1JFP:		
NR1N:	Cal Calvito	WA1WOK
WB2JLR:	Tadd Torborg	KA2DEW

Technical Committee:

chairman:	Rich Place	WB2JLR
NRS:	Linds Collins	NR1N
NRS:	Jim Wzorek	K1MEA
NRS:	Dana Jonas	WA2WNI
	Tadd Torborg	KA2DEW
	Chris Piggot	WZ2B
	Howie Cohen	WA2TVE
	Don Russ	N2CZL
	Bob Seger	WB2QBQ
	Cal Stiles	W1JFP
	Kevin Wright	WA2VAM
	Mark Oliver	NM2J

BBS Committee:

chairman:	Jim Wzorek	K1MEA
	Herb Salls	WB1DSW

NEDA Emergency Services Advisory Committee

cochair:	Dana Jonas	WA2WNI
cochair:	Cal Calvito	WA1WOK
	Kevin Wright	WA2VAM
	Chan Eddy	KA1OU
	Jack Abel	KB2CS
	Well Farr	WB3CUF

Hexipus Project Committee

chairman:	Howie Cohen	WA2TVE

Summer Board Meeting July 27, Oneonta NY

The meeting will be called to order at 10AM, July 27, 1991 at the SEMO bunker in Oneonta NY. The meeting is hosted by Don Russ, N2CZL and the Eastern District Office of New York State Emergency Management Office (NY SEMO). Agenda items should be submitted to W1JFP @ W1JFP. NH.USA. The meeting is open to all NEDA voting members. Memberships and membership upgrades are available at the meeting. As this is a board of directors meeting the function of the meeting will be primarily administrative.

The meeting site is under 2 hours from Binghamton or Albany. To get there from either direction start on Interstate 88 heading for Oneonta.

Directions:

Get off Interstate 88 at exit 15 for Rt 23 south.

This will take you down the James Letis Highway then Main Street and then Chestnut Street. Follow Rt 23 signs as you will be making several turns!

Finally turn right onto West Street. This will be at a traffic light with a Pizza Hut takeout, a Daily Star Newspaper and a U-Tote-um Laundry.

Follow West Street for a couple of miles past the colleges, keeping an eye out for the large radio tower on the left which stands at the SEMO bunker. At the "Oneonta Job Corp. Center" sign turn left.

You will pass several buildings which are part of the Job Corp. Behind the buildings is a fenced in parking lot which is for the SEMO underground bunker. Park there. Walk into the tunnel.

Talkin

Talkin on 146.85 repeater and 145.23 repeater.

Overnight info:

Holiday Inn Rt 23 south side is 607-433-2250. Single is $76. Double is $84. The price is high because it is tourist season. There are cheaper places 15 minutes further away. Contact N2CZL, Don, at 607-967-6208 for alternative lodging. There are camp grounds aplenty.

The meeting will be called to order at 10:00 AM.

—N2CZL

—Host, Summer Board Meeting

Network Development in the Ottawa Area: 1991 Update

Barry McLarnon, VE3JF
Ottawa ARC Packet Working Group

The Local Ottawa-Area Network

The Ottawa area is served by one major node site, plus a number of subsidiary nodes. The major "hub" site, at Carleton University, is the home of the Hydra packet switch. Hydra actually consists of two separate systems. The switch itself ("hydra-gw"), which is a PC AT running KA9Q NOS, currently has four ports. Two of these are 9600bps serial interfaces into the 2m NET/ROM nodes OTTAWA (145.07 LAN) and CAPITL (145.01). The third port uses an Ottawa PI board to interface into the 56Kbps LAN, which is served by a full duplex cross band repeater (220.55 in, 433.44 out) at the same site. Finally, there is an ethernet port which is connected to the Carleton campus ethernet. Also on the ethernet is the second part of Hydra, a Sun-2 workstation, which is a Unix system with a large amount of disk storage. This system will be the platform for developing various services for the amateur packet community. In addition to various servers such as on-line callbook lookup, the possibilities include a gateway into the Internet itself.

The 56Kbps full-duplex network is, as far as we know, the only one of its kind in the world. It began as a high-speed LAN for the "power users", but it has evolved to a combination LAN/local backbone network. This goes against the conventional wisdom of keeping LANs and backbones separate, but it is successful because there are no hidden transmitters, and the capacity is more than sufficient to handle both functions. When the 56Kbps network begins to get congested, our plan is to "twin" the cross band repeater with a second one, using additional 100kHz channels in the same bands. It is remarkably simple to add a second repeater in this way, since the antennas and RF gear can be shared between the two repeaters, with power combining/splitting done at the 28-30Mhz IF of the 56Kbps modem.

The 56Kbps network provides the

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Constitutional Change

At the 1st Quarter Board meeting two items were brought to the board for consideration as changes to the NEDA constitution. These were:

1> A proposal to make the annual elections by mailed ballot with the elected officers to be announced at the general session. This proposal was submitted by Jim Wzorek - K1MEA.

2> A proposal to eliminate the requirement for a general session.

These items will be addressed and details discussed at the 2nd Quarter Board meeting. Anyone with input should attend this meeting and make their opinions known.

—WA2WNI

—NEDA Secretary

NEDA TCP Experiment

I have installed a dual-port TCP/IP switch at my house in Springfield Mass. The "user port" side of the switch is on the 146.415(+1Mhz) packet repeater located in Tolland, CT.

There are many TCP/IP users in CT and W. Mass on this frequency, and the KA1JY-9 [44.88.0.25] switch links into E. Mass, NH, Southern CT, and Long Island. The "backbone" side of the switch talks directly to the NEDA network through an HTS-free link, and currently will route Rochester bound datagrams to IPROCH (WZ2B). WZ2B will route W. Mass, E. Mass, NH, CT, and NYLI datagrams back to my switch (IPWMA, NQ1C-6, [44.88.1.11]).

The switch is part of an on-going TCP/IP experiment by NEDA to determine the feasibility of TCP/IP routing over the network, the impact it will have on other network traffic, and the effect of other network traffic on TCP/IP. The switch is not intended for use by TCPers over the network - It merely uses the network as a transport for it's IP routing.

Initial findings are encouraging, although our testing has been quite limited at this writing. Routing between W. Mass and Rochester seems to be somewhat slow, but reliable. It appears that TCP/IP is not overly aggressive on the network, so heavy IP activity should not severely degrade the network.

I hope to have more information on our findings, and how to use the TCP/IP switch, in the next Quarterly.

—Bob, NQ1C

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link from the Hydra switch to the three Ottawa area BBS stations (VE3JF, VE3NAV, and VE3KYT), to users on two additional LAN frequencies (144.91 and 145.03), and to a conference node. This network offers an easy means of "spreading out" the 1200bps 2m traffic so that low-speed users can continue to get adequate access to the network. A user on the 56Kbps network can attach a 2m port to his station and open up a network access port on a new frequency for users in his area. This is what you might call a "cellular LAN" approach. In a traditional LAN with a wide-coverage node, modelled after voice repeaters, you have too many users, too many hidden transmitters, and therefore many collisions and a terrible throughput. In a cellular LAN with more limited coverage, you have fewer users, and since they are located in a smaller area, less chance that they are hidden from each other. An additional benefit comes from the fact that the cellular nodes are located at home stations, and therefore are easier to maintain.

The basic model for network development in the Ottawa area therefore is:

(1) A central switch with expandable capabilities, and offering access to various services for network users.

(2) One or more high-speed full-duplex repeaters which link the switch to other area nodes, as well as to some individual users.

(3) A number of low-speed limited-coverage network access nodes, on different frequencies, with the frequencies reused as appropriate. Each frequency has one, and only one, node for a given "cell", so that there is no node-to-node traffic on these frequencies.

The main departure from this model at the present time is on 145.07, where the OTTSAT node, which serves as the access point to the Calgary-Ottawa "wormhole', resides in addition to the OTTAWA node. The OTTSAT node is expected to be removed from this frequency sometime in 1991, and it will either be added to the 56Kbps LAN or provided with a dedicated point-to-point link from hydra.

Trunk Links to Other Areas

Improving our links to other areas is a high priority for the Packet Working Group in 1991. Other than the Calgary link, all out-of-town linking remains dependent on the grossly overloaded 145.01 network. One reason we have been slow to upgrade these links (other than our preoccupation with the local high-speed network and switch development) was the possibility of obtaining additional satellite links, from the OTTSAT gateway to Montreal, Toronto, and possibly other points. This has failed to materialize, and although chances are still good that something may happen, it is clear that we can no longer afford to wait. Furthermore, we should not let the possibility of using commercial satellite channels for some of our links divert us from the goal of building an autonomous fully-connected amateur network.

We are anxious to work with neighboring groups to install backbone links for trunking packet traffic between Ottawa and the surrounding areas. We do recognize that any collision-free backbone link, even if only 1200bps, would be a vast improvement over using 145.01 and would do a reasonable job of handling the current volume of BBS mail. However, we also feel that we should aim for much higher performance. Not only will the amount of mail and bulletin traffic increase quickly as the link capabilities improve, but users will require more throughput for applications such as file transfers and logging into remote servers. We feel that 9600bps should be regarded as a minimum standard for trunk linking two major network nodes, and our preference would be to have 56Kbps on these links before long. We would therefore urge that network planners who feel that it is not feasible to go the higher speed immediately at least give serious consideration to providing an easy upgrade path.

Providing an upgrade path involves two key issues:

(1) Selecting a band (or bands) in which at least 100khz bandwidth channels are available. This means putting the link on a frequency above the 2 meter band!

(2) Designing sufficient margin into the link such that it can be upgraded to 56Kbps without changing the antennas and feeds.

With regard to the second point, there is a convenient rule of thumb: in order to work adequately at 56Kbps, the link will require approximately 10db more margin than is needed for 1200bps AFSK. For example, if a link works okay at 1200bps with low-gain omni antennas at each end, then replacement of the antennas with small yagis should provide sufficient margin for upgrading to 56Kbps (assuming the same power levels).

There are a number of reasons that the Ottawa working group has a strong preference for using the WA4DSY 56Kbps modem in linking projects. After working with the modem for nearly 3 years, we have a good deal of experience with it, and a high degree of confidence in its capabilities and reliability. It offers much higher value in terms of bits per second per dollar of investment than the lower speed modems, and its higher throughput means a longer lifetime before obsolescence. It is very easy to deploy, since it is a self contained RF modem which does not have to be interfaced to standard radios - its 28Mhz IF is simply converted to VHF/UHF using a standard transverter (or separate receive and transmit converters, in the case of full duplex). And it will run full duplex with no difficulty, unlike some lower speed modems.

The use of speeds of 56Kbps or more necessitates the upgrading of nodes with more capable packet switch hardware than the TNC2. Like the Ottawa Hydra switch, a multiport node can be configured fairly inexpensively around a PC AT class machine. The TNCs can be retained to handle the low speed nodes. For major node sites with multiple 56Kbps (or higher speed) ports, a more attractive proposition is the Grace PackeTen packet switch board. The latter board can make use of a PC as a host, so again there is a clear upgrade path if a PC is used for the switch.

—VE3JF, Barry McLarnon

[Editor's note: VE3JF is not a NEDA member and probably has not read the club literature. My personal belief is that the NOS switches that Barry is suggesting as node sites are indeed the way of the future. See the TCP/IP article on the front page. Grace makes a stand-alone version of the PackeTen which is capable of handling the rougher environments and will run NOS without the PC. For the moment NOS switches are not accepted by NEDA for use as NEDA network hardware. I would also not like to discourage someone from putting up a

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Saratoga Network Gateway On Line

The linkup between the NEDA network and the Saratoga County RACES packet network is now in place and operational. Cooperating in the effort to get the link in place were Jim WA2UMH and Dana WA2WNI.

The link connects the SRTGA1 node in Lake Nancy NY with the ALBANY node in West Grafton N.Y. via a low power directional UHF circuit in the 433 MHz range. The port on the NEDA side of the Gateway at the ALBANY site is ALBNY3. To use the gateway going north: connect to ALBNY3 and then connect to SRTOGA. To use the gateway going south: connect to SRTOGA, then to NEDALB.

This single stepping routine and configuration is what protects each side of the link from ingress of data or broadcasts from the other system that could potentially upset each system's operational characteristics.

BBS ops in the NEDA side of the system may use this circuit to reach WA2UMX BBS which is reachable as a directly connectable mnemonic from the SRTOGA end of the link.

Difficulties in traversing the link should be reported to WA2WNI @ WA2PVV should they occur. The previous WMA220 to WA2UMX-12 is presently not operational and may also be decommissioned due to the loss of the lower end of the 220 band to ham use.

An alternate to pass traffic headed for WA2UMX is to forward it to WA2PVV if sent from the east or WA2TVE if sent from the west or if the network fails W2RGI. W2RGI and WA2PVV have backup 145.01 paths to WA2UMX.

—WA2WNI

—Eastern NY NRS

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node just because it can't be upgraded to high speed. I don't think that Barry meant that either!

Board members of NEDA have made strong statements in regards to packet radio connections to the Internet and there are many technical implications that must be worked out in order for such a gateway to be legal.

Thank you very much for this contribution Barry and hats off to the Ottawa crew for an excellent city-wide network!]

Software Wanted!

NEDA is in need of a handful of software utilities to help diagnose, troubleshoot and configure network nodes and links. Specifically what is needed is programs that can be run on an IBM PC/XT/AT or compatible computer that will allow a node sysop to poll or interrogate a node and make changes to that node quickly and efficiently to keep network operation up to snuff. Currently, when a node sysop needs to make changes, the node must first be checked for operation, then put into "sysop mode" and then the changes made. All of this is presently done via manual lookup tables and comparing past or present values with those changes that need to be made. Discrepancies in parms, or specific port characteristics of interest must be manually noted or logged by the sysop, then reviewed or compiled later to figure out what is going on or if changes have been effective. This can be very tedious and requires that NRSs (Network Regional Sysops) have a very good memory of what is going on and what changes have been made and they must be rigorous and complete in their notes..

I have several ideas of good software projects which desperately need doing. There are many other ideas floating around as well. I am willing to offer technical support, encouragement and a dozen test sites. I will also see to it that the program author gets full recognition for the effort, and the program made available world wide to help with network management. The program will be released into the public domain with full credit to the author. Sources and data files will be released as well. Your callsign becomes a household word for hundreds, if not thousands of hams who operate nodes. Everyone who submits a program will get mention in the NEDA Quarterly. KA2DEW has volunteered to create documentation to support your efforts if you like.

Here's what I am looking for. Remember that these are general ideas for your program and not absolutes.

In order to complete some aspects of these projects you'll need some support from your local NRS. As it is the NRSs that will benefit most from these programs you can be sure of getting exceptional support. This is a real

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Regional Technical Development Meeting: Scranton Pa.

On April 6th a technical development meeting was held in Scranton Pa. The following NEDA members attended:

WB2QBQ	Bob Seger
WA2VAM	Kevin Wright
KA2DEW	Tadd Torborg
WA2WNI	Dana Jonas
KA3ODJ	Andy Horn
N2CZL	Don Russ
NX2P	Bill Slack
N0NDO	John Painter
WB3LWR	Bob Chimel
KC4ZWI	Pete Presti

Talk was had about putting up nodes in the Scranton area to link Binghamton or Elmira to BANGOR via Scranton. Presentations were made on TCP, DxClusters, PBBSs, ROSE and TheNET.

The person who did the TCP presentation KB3YV stated that his goal was to get a LAN up so that local users could access Internet via packet radio. High speed is desirable and long distance amateur packet networking is not necessary as Internet provides world wide networking.

The person who did the DxCluster presentation stated that he wanted a DxCluster-only network to support the DxCluster activity and that the way to handle large volumes of users was to use as many 2m channels as necessary with wide coverage 2m access to DxClusters. Cooperation with a general purpose network group was not necessary or beneficial and no attention to the scarcity of 2m channels was given.

The BBS presentation was by K3RLI who gave a lengthy presentation on the FCC vs packet controversy. Ed (RLI) didn't promote or demote the cause of general purpose networking and is not planning on helping the cause.

The ROSE presentation was by NX2P who is very much in favor of doing long distance networking using all of the NEDA philosophy but limited to ROSE node implementation. Bill (NX2P) says he will be working with WA2WNI and others to link up a budding ROSE system in NJ and Orange County NY to NEDA nodes in eastern NY.

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New Deal Available on UHF HTs

About a year or so ago some NEDA member may recall how we were frantically buying up Wilson MH-400 UHF HT's that we then put into links in a number of places. WA1TPP did an article for the Quarterly that showed us how to speed up and utilize the rig for packet as efficiently as possible and thus a number of links and special ports were put on the air as a result of these inexpensive little 2 watt hand held rigs. (The rigs only cost us about $80 each!)

Well, it appears that the original vendor has struck yet another bargain with the folks at the Wilson/Regency warehouse and managed to make another incredible bulk buyout. The deal this time is for UHF Regency MCPU-404 handhelds. These rigs are new closeouts that are 4 channel, 4 watt crystal controlled handie talkies. While they don't come with antennas or batteries, the vendor is selling them to us for the incredible price of $49.95 each plus shipping. If you should choose to use the rig as a portable and not canabalize it for a packet link the vendor will sell you a drop in charger for $29.95 and batteries for $20 each. The batteries, bye the way, are the same ones used by the Yaesu FT 203 and 209 series radios, known commercially as a BP-4. The crystals it takes are HC-18u size with wire leads and the unit also has a factory installed jack that will take a plug in CTCSS board.

Please contact the vendor directly as we will not have sufficient time to put together a NEDA bulk buy like in the past. He was kind enough to let us in on the lower pricing because of being on his preferred buyers list from the previous 30 or 40 odd units we bought before. Please move quickly on this as the vendor might do something like raise the price or sell the whole lot to someone. The address:

Torg's Electronics
9280 W. 360N
Shipshewana, IN 46565
Phone: (219) 768-4406

The proprietor is Mr. Torgeson so should you give him a call to get in on this, make sure to pass on the regards and best wishes for all the NEDA members already taking advantage of the bargains he has provided us in the past. Who knows? With a little effort maybe we can get Mr. Torgeson to get his ***own ham license***!?!

Oh, one more thing....Manuals for the unit should be readily available from *Regency Electronics*, or Torg's can most likely provide you with a copy for a nominal extra cost.

—Dana WA2WNI
—KNDRHK & ALBANY node op

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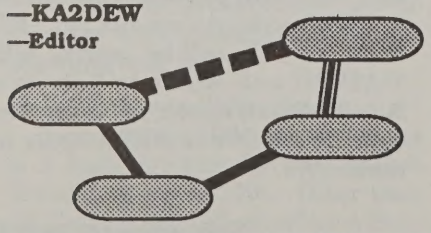
The TheNET presentation was done by KA2DEW who promoted the same thing that NX2P was promoting and offered that TheNET was more fun to play with than ROSE.

It was an interesting meeting. Dinner afterwards was, as is traditional it seems, held at a Pizza Hut. Conversation after the meeting, at the meeting site and at dinner was lively and positive. My impression is that there are some people in the Scranton, Wilkes-Barre area that are very anxious to get hooked up.

Dana, Bob, Pete and I finally arrived back at KNOX node (Bob's house) at about 1:00 AM.

—KA2DEW
—Editor



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good way to get directly involved with the NEDA technical committee. Please contact me via packet at WA2WNI @ WA2PVV or connect to my home station WA2WNI from the DANA node at the KNDRHK node. (Connect to KNDRHK and then connect to DANA and then connect to WA2WNI) You can also leave mail for me directly on my PMS, WA2WNI-4 from the DANA node.

List of features for all programs:

- The program must be able to run on an IBM XT or AT or compatible computer and not require more than 640K RAM and 1 floppy disk.
- The program must work without graphics although graphics support is OK as an option.
- The program should use an RS-232 port to send/receive data to/from a TNC2 compatible TNC such as a PacComm Tiny-2 or MFJ 1270B or equivalent Terminal Node Controller. G8BPQ compatible would be great but is not necessary.
- Program may be written in C, PASCAL, 8088 assembler, BASIC or Turbo BASIC

Here are two ideas for utilities that all of the NRSs in the NEDA network and most other TheNET node ops on the continent could utilize.

Automatic Node Manager

This application is intended to release a sysop from the tedium of connecting to a given node, checking its nodes list, routes, parms, ident and then making any changes that are needed after using the Sysop Password to gain remote control of the node.

• User enters node name. Program accesses disk and finds connect path info and node password string. This info must be stored in text format so that it can be edited with IBM PRO editor, Norton Text Editor, SEE, Brief or some other simple text editor.

• The program can connect thru the network to the requested node via the path specified on disk.

• The program should read and save the nodes list, routes list, parms, info string, users top line and bad command message. This should be viewable from in your program.

• The program can send the sysop code and answer the password string. A flag should be set in the program to remember that the sysop operation has been done. If it has not been done then it should be done whenever the user tries to perform a function that requires the sysop privilege.

• The program can receive the parms dump and by interrogating the USERS command response can analyze the parm dump depending on the TheNET software. A menu is presented that shows the parm meanings, current values, stored prepared values from the node's file, and NEDA recommended values for this type of node (bkbn, gateway, user). Differences would be highlighted. By pressing a few number keys or by using cursor control the user should be able to select parm values to change and then when done with changes should be able to send all changes.

• An info text editor should be able to receive the existing info text, edit it and then put it back. The program figures out what the node software version is via the USERS command response and then presents the user

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with an editing page that shows number of bytes used, left and shows the text as it is being edited. Because v1.1 TheNET only allowed 80 characters to be changed while TN2.08 allows 160 the program has to be pretty smart. The v1.1 version should show the fixed part of the info text as well but not allow it to be changed.

• The user should be able to load parms from the file on this node. The desired parms should be saved in a separate area in the file than the actual parms. A feature should exist that copies the actual parms into the desired parms area.

• The program can ask the node for all three routes to all of the nodes that are returns with the NODE * command. The list can then be correlated with the ROUTES command to show all nodes sourced from all neighbor nodes.

• Response time for each message sent should be obtained and displayed on the screen along with the current date and time.

• The user should be prompted for a text string asking what changes are needed and why. This text plus sysop commands sent, average response time and date sysopped should be recorded in a append area in the file.

• An *abort procedure* function must exist so the user can dump out of any operation.

Network Diagnostic Package

This software package is intended to give sysops some assistance in evaluating various characteristics of operation and node statistics. Presently the various regional sysops spend a great deal of time trying to keep up with how things are working. It is their job to try to keep the traffic flowing, and make sure that all viewable nodes that show on node lists are connectable. Outages that cannot be cured or temporarily bypassed need to be promptly reported to not only those responsible for maintenance, but various users (such as PBBSs) that depend on up to date information on appropriate routing and throughput efficiencies.

This program is very similar to an older program called "Net Walker". The basics of the program are that it connects into the network as specified in it's configuration file on disk. It does a nodes list on the local node and then attempts to connect to every node on the nodes list. If it runs into a BBS it waits for the > prompt and then disconnects. For each node that it connects to it performs a Routes command. Any callsigns that it sees on the routes command that it doesn't have already it will try to connect to. To do this it will have to disconnect each time and connect back out. Some nodes cannot be connected from. At each node it should acquire the info text, parms, and routes.

After the program runs out of nodes to connect to or after it is aborted it should generate five documents:

- A list of nodes sorted by distance from start.
- A list of nodes sorted by suffix of callsign.
- A list of nodes sorted by node name.
- A complete record of all info texts, parms and routes and average response time should be printed for each node sorted by node cluster sorted by node name. A node cluster is how ever many nodes are connected together by RS-232 routes (port 1).
- A list of node, route and parm changes.

The program should be configurable to run automatically at a preset time.

Optional features: An ASCII file analysis routine to "munch" the data collected by the Diagnostics and then issue a report. This could work much like the present W0RLI PBBS monthly statistics routines do. Desired data would be nodes lists comparisons, node reliability, path reliability, parm changes, new info texts, routes lists comparisons or flagging of new routes recognized.

Conclusion

So there you go. Here's a good start on what we need to help with network management. This seems like the kind of project that could be done by students or a group of students. Any professors/teachers out there?

My address is:
WA2WNI - Dana Jonas
RD. #2 Box 92
Valatie, New York 12184

If you have questions about the applications or merely wish to make comments about what you think might be usable ideas for the participants of the project, please feel free to contact me.

—Dana WA2WNI
—NEDA NRS, Eastern NY

TCP/IP from page 1

computer to another over any number of intermediate computers. Unlike FTP and TELNET which require that an end to end path must be established in real time SMTP allows messages to traverse the computers that are available and then wait for computers that are unavailable and then proceed when they come on line.

FINGER is a command whereby a user can ask a remote machine for information about another user. Thus I could do a finger on the user NQ1C on the machine NQ1C and get back that NQ1C is Bob Lafleur and whatever other information that Bob wants his finger file to contain.

PING is command to send a packet to a remote computer to find out if it is connected to the network and if so how long it takes to get a packet there and back.

There are many other useful protocols built into TCP/IP that allow such things as data sharing between programs running on two different computers, identifying what hosts are available, finding out the time at a remote machine, authenticating passwords and even passing silly quotes.

Message routing with TCP/IP is based on a 32 bit address and aliasing. Each host computer is given it's own specific 32 bit network address and a text alias. The text alias for amateur TCP/IP is usually callsign.ampr.org. The .ampr.org is used to differentiate the amateur network with the commercial networks in cases where there are tie ins between the two. The 32 bit address if of the form 255.255.255.255 where each of the numbers is called an octet signifying that it uses 8 bits. Each of the four octets from left to right decreases in priority. The first octet is used to determine whether the destination address is ham, military, commercial, educational, etc.. The second octet might indicated which state the destination machine is in. The third, depending on how the ham TCP/IP addressing committee decides to run things, might determine a network node output or a county or city. The last octet determines which individual machine that the message goes to. So, given that the network extends across the country, it should be possible to address a message from any TCP computer to any other. The address-

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TCP/IP from page 1
ing system also allows for more than one user at each machine. Thus I can be ka2dew@k1tr.ampr.org which is different than k1tr@k1tr.ampr.org.

The process in the TCP program which sends messages from the host and waits for acknowledgment from the destination station is more sophisticated than TheNET. With TheNET up to four messages are sent out of the originating node and then when acknowledgments come back for those messages new messages can be sent out again. Four messages may be outstanding at a given time. If an acknowledgment for a message doesn't come back for 5 minutes the originating node will regenerate the message. With TCP/IP what is a 5 minute timer in TheNET is automatically adjusted depending on previous performance of the link. This is called 'backoff'. TCP/IP is loaded with this kind of intelligent networking features.

TCP/IP using the KA9Q software package is very easy to modify. NET.EXE which is the original KA9Q package has been added to by dozens of other amateurs. NOS, Network Operating System, is updated and customized by many hams for many purposes and is entirely public domain. This is in contrast to TheNET which is only modifiable with great difficulty.

TCP/IP is a mature protocol system due to the vast number of people working with it. TCP software is available for most computers. It can be run over a huge number of different kinds of data links. It is extremely powerful. It is in use on many, if not most, commercial workstation systems in the world. Sun Microsystems, Apollo, HP, Xerox, DEC, Apple, Next, Wang, and most other computer companies either use TCP/IP exclusively or at least offer support for it as a standard feature of their computers.

Why Aren't All Packeteers Using It?

The first reason is that it won't run in a simple TNC. It is quite possible to have lots of fun and take advantage of many of packet radio's capabilities without TCP/IP. Truly there are things that we can do **with** TCP/IP that we can't do without TCP/IP. Many things we're already doing without TCP/IP could be done better **with** TCP/IP. That won't convince all packeteers to use TCP/IP from their homes. At this time TCP/IP still requires a computer somewhat more powerful than a TNC.

The NEDA network currently doesn't allow access to TCP/IP users. The reason is that TCP stations are themselves networking hosts. They can source high volumes of data to the network at will and can be remotely controlled from other TCP stations to do this. In order to function across the network TCP switches, by there very nature, must be independent of the controls that TheNET places on network traffic through the TheNET parameter controls. Specifically, retry rate and window size are controlled for NEDA AX.25 users but couldn't be controlled for TCP/IP users. In addition the NEDA network user access policy is designed to permit **equal** access to network services by all stations. Because of the way packet works in regards to hidden transmitter syndrome, stations transmitting into a user port cause much more loading than stations receiving **from** a user port so having TCP/IP stations on shared 2m channels would not be fair. The way that NEDA is currently planning on interfacing TCP/IP to the network is that selected TCP/IP hosts would gateway into the network via hidden transmitter free links on 220, 440 and up. Those gateway hosts will be operated in accordance with NEDA technical committee specifications. (Hopefully the number of TCPers on the technical committee will take a giant leap in the near future!) Other TCP stations would then access the network via the gateway TCP host.

Beyond that in the more distant future there would be NEDA nodes that are based on NOS (Net operating system) which is a program that supports TCP/IP **and** TheNET. One or more ports on the NOS node would then be available for TCP access to the network. An intriguing capability of NOS is the ability for a TNC-only user to connect into the NOS node and then use it's TCP features.

For now

For now the NEDA Board of Directors has declared that only WZ2B and NQ1C will operate as TCP gateways into the NEDA network. This is for a trial period until they have had time to analyze the effectiveness and problems with TCP across the NEDA TheNET network. They will then report their results at a NEDA board meeting. Stay tuned to this column for more information on the subject or contact NQ1C or WZ2B. If you are interested in participating in the NEDA technical committee please contact Rich, WB2JLR @ WB2WXQ. Rich is the chairman of the NEDA technical committee.

—KA2DEW

—NEDA editor

Active Coupler for Mating A G8BPQ PC to a Hexipus TheNET/Diode Matrix

Quite a few of the switching systems in use today on the NEDA network feature not only a multiport node but also a PC-based BBS or mailbox. The node setup on most of these systems involves the use of a diode matrix to allow all the TNCs to transmit and receive data harmoniously with one another. And, most of these diode matrices are in the form of a small circuit card (like NEDA's HexiPus) which holds the various passive components. Because these sites are often in key locations, the SYSOP can, and often does, opt to incorporate a BBS or mailbox to compliment his/her setup.

These BBS/mailbox incorporations also include in background implementations of John Wiseman's outstanding network software packet (hitherto referred to as "BPQ") to allow for multiple connects into and out of the mailbox software. BPQ's original intent was to provide an easy way for hams to create packet data switches using their already existing IBM or compatible computers. A serious drawback exists because should the computer crash for whatever reason, the switch code itself dies until the computer is reset. To be effective for a large multiport node setup, BPQ often requires a very fast (and very expensive) computer to handle the many streams of data.

A very real advantage of using the diode matrix card in conjunction with the BBS/mailbox combination is that the matrix never "dies" allowing the node to stay active even when the PC's hardware or operating system fails or is taken off the air for whatever reason.

BPQ code though was thought impossible to add direct to this diode matrix. The signals just weren't compatible. To get around this and the

Continued on next page

Active Coupler from page 8

more important limitation mentioned above, NEDA devised a scheme whereby placing two TNCs "front-to-front" would allow for the node to exist on one side and the BBS/Mailbox to exist independently on the other. By facing these TNC's HDLC (radio) ports toward each other, the RS-232 ports became usable - one looking toward the matrix and one toward the BPQ code and the associated BBS/mailbox.

As this idea developed, we progressed from simply cross wiring the Tx/Rx lines off of the DIN connectors to picking the digital Tx/Rx signals off of the modem disconnect headers inside the TNCs. This allowed us to set the baud rate of that link up to 19200 baud.

Two advantages were apparent. First, the computer could crash all it wanted but the node stayed a viable, active part of the network. Second, the computer now was not burdened with the awesome task of switching data between its serial ports plus doing the work on the BBS. However, this involved the use of two TNCs - a couple of hundred bucks just to do this? Boy, was this expensive! There must be a better way.

Enter yours truly. I had a spare older XT and a temporary allocation of TNCs connected to the matrix to play with and besides, I had an afternoon to kill.

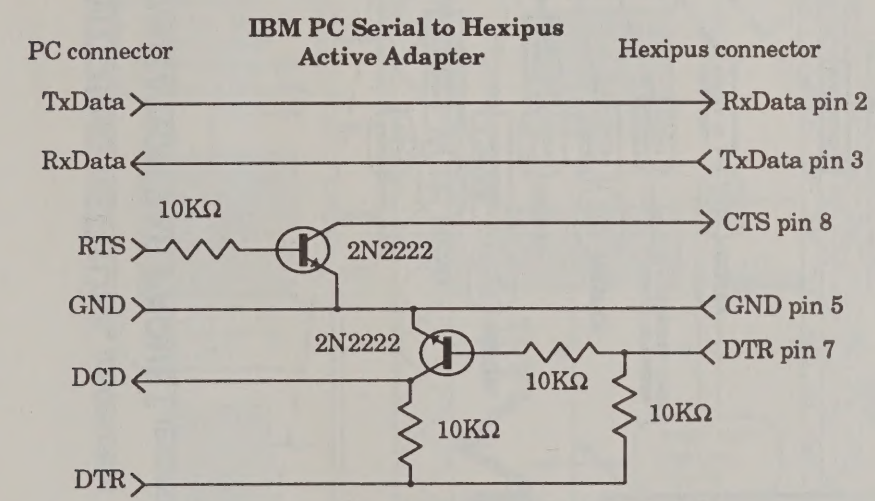
I reasoned that since BPQ code was basically simulating a TNC-like device, why couldn't it be directly connected. I quickly drummed up a working version of the BPQ code and configured one TNC (with TheNET 1.16) as a node via the matrix card. As a start, I just tied the various lines off of a vacant port of the matrix to match the RS-232 lines on the PC's serial port. Needless to say it didn't work. So I started taking things off and rearranging them. When I took the RX and TX data lines and reversed them, it started working! After a brief period of testing, I published my findings to NEDA @ W1NY and got some enthusiastic bravos.

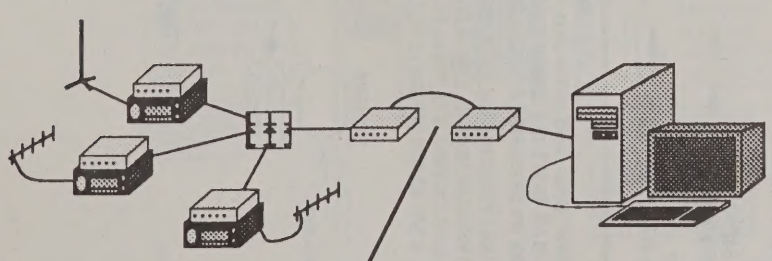
Rich Place, WB2JLR made one important addition however which I didn't account for. The DCD circuit was doomed to fail in that my little "experiment" didn't incorporate more than one TNC. Rich was certain that placing the PC on the matrix with more than one TNC would cause problems without correctly using the DCD/CTS collision detection scheme. He drew up a simple way to use the DCD circuitry between the PC and the matrix using two 2N2222 transistors and some pull-up resistors. This circuit inverts the states of the DCD and CTS lines from the PC, making them work with the DCD and CTS from the TNC 2s.

Since implementing this, I have regained two shiny new TNCs for use elsewhere, reduced the load on my 12V DC power supply by 2 TNCs and eliminated a source of traffic delay between my BBS and the rest of the network. (Someone recently pointed out that they had noticed an overall improvement in the speediness of the return data). As an extra added bonus, by setting the BPQ code up with certain parameters turned on, I get to see all the L3 and L4 activity between the BBS and it's users as well as all internode traffic and TheNET activity between the TNCs on the matrix, something I was unable to do previously. One down side of this method is that I lose my "Mail For:" beacon (who cares!).

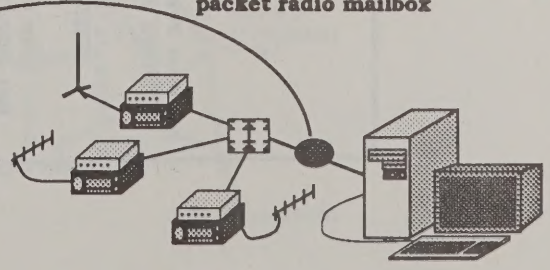
My thanks go to Rich WB2JLR and Mike N1BEE for their help and encouragement. Special thanks to Tadd KA2DEW and Rob KC3BQ for the original thoughts and work on getting this system off the ground.

—WB1DSW, Herb
—KNGSTN node op
BBSDSW/NEgate BBS sysop
New England's longest running packet radio mailbox





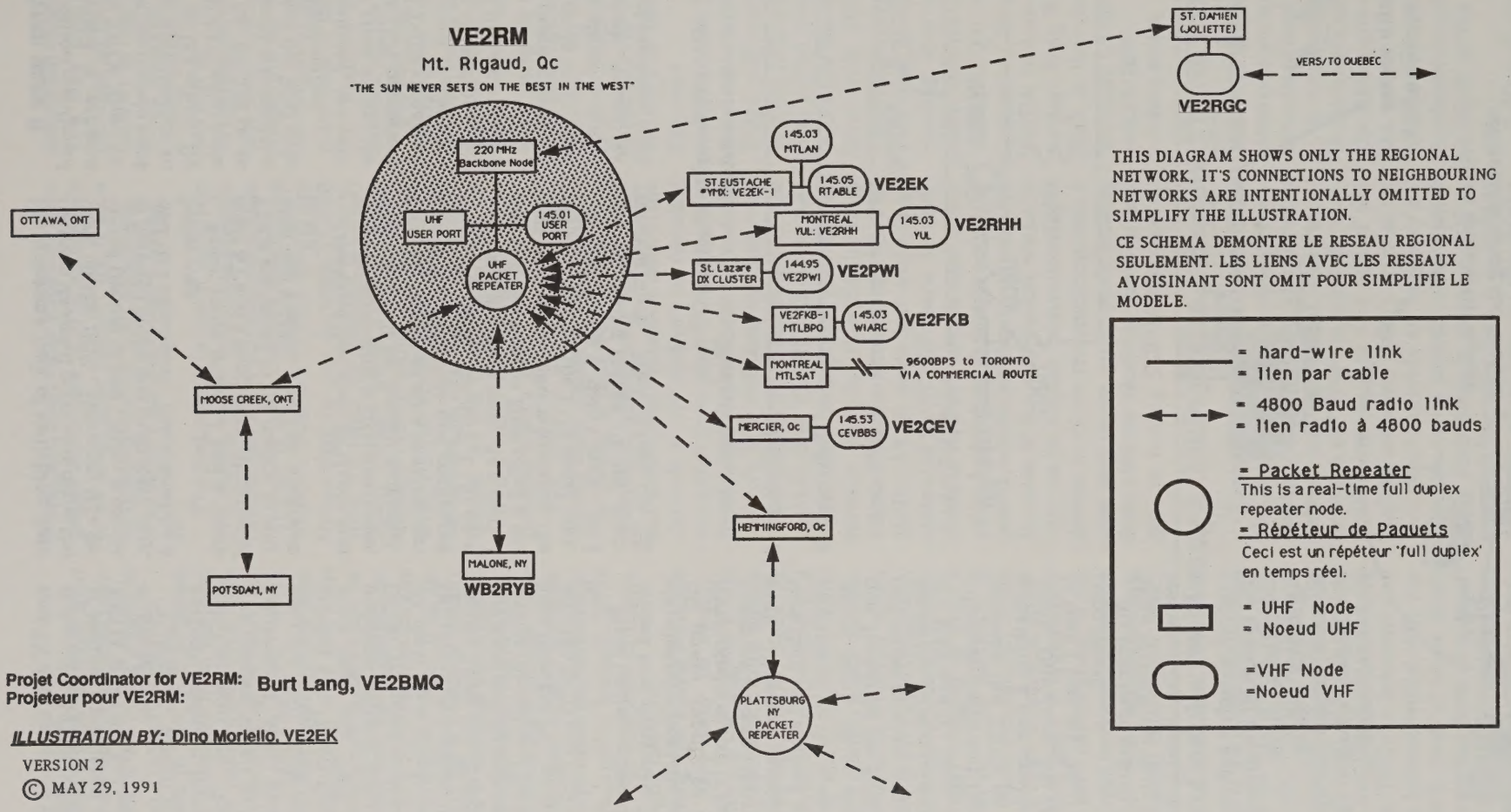
NEDA node with server connected using a wireline link.



NEDA node with server connected using the 'Active Adapter'

THE REGIONAL UHF PACKET SWITCHING NETWORK (PROPOSED)

LE RESEAU REGIONAL UHF DE COMMUTATION PAR PAQUET (PROPOSE)



THIS DIAGRAM SHOWS ONLY THE REGIONAL NETWORK, IT'S CONNECTIONS TO NEIGHBOURING NETWORKS ARE INTENTIONALLY OMITTED TO SIMPLIFY THE ILLUSTRATION.

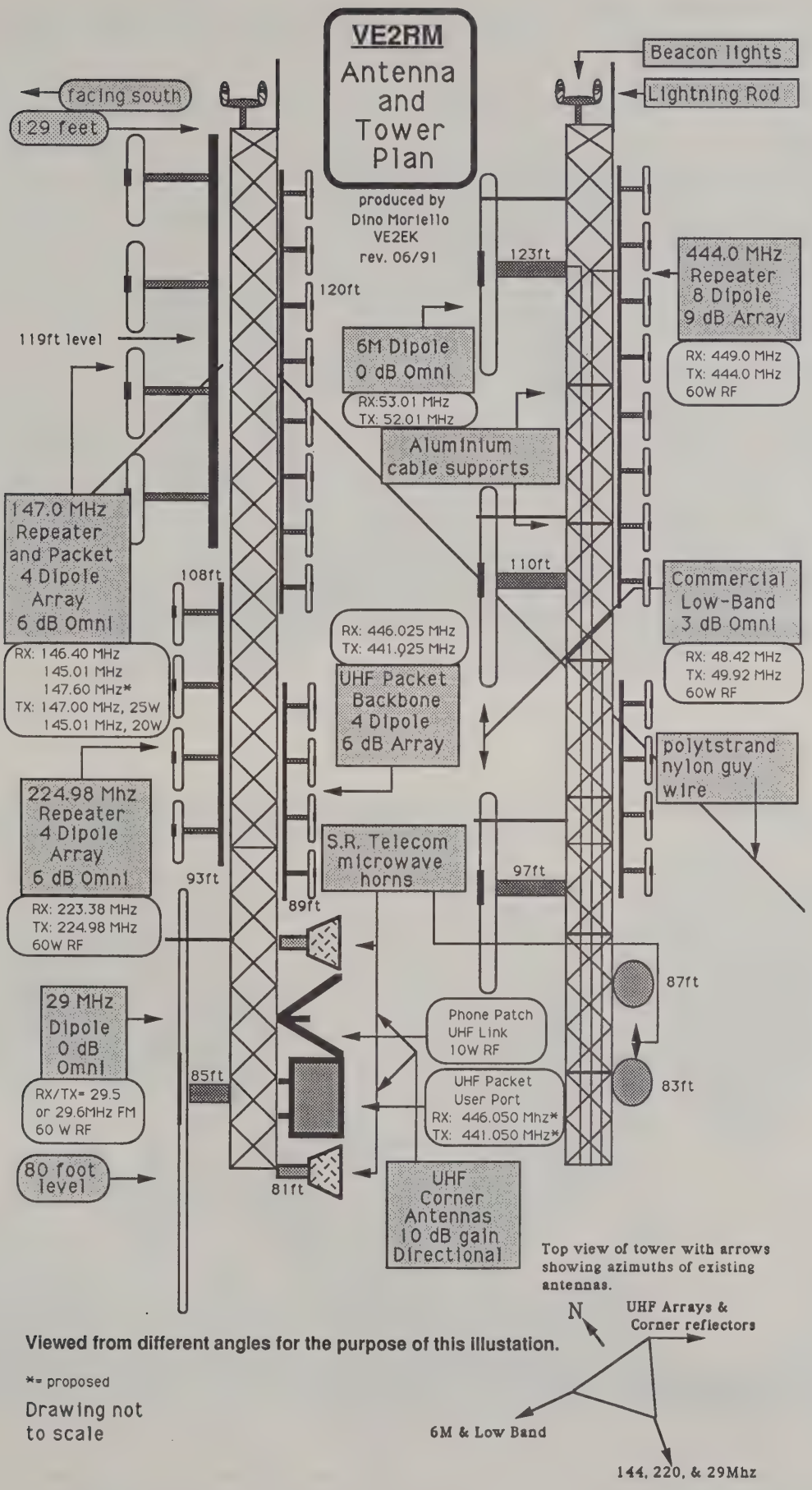
CE SCHEMA DEMONTRE LE RESEAU REGIONAL SEULEMENT. LES LIENS AVEC LES RESEAUX AVOISINANT SONT OMIT POUR SIMPLIFIE LE MODELE.

- = hard-wire link
- = lien par cable
- = 4800 Baud radio link
- = lien radio à 4800 bauds
- = Packet Repeater
  This is a real-time full duplex repeater node.
- = Répéteur de Paquets
  Ceci est un répéteur 'full duplex' en temps réel.
- = UHF Node
- = Noeud UHF
- =VHF Node
- =Noeud VHF

Projet Coordinator for VE2RM: **Burt Lang, VE2BMQ**
Projeteur pour VE2RM:

ILLUSTRATION BY: **Dino Morielli, VE2EK**

VERSION 2

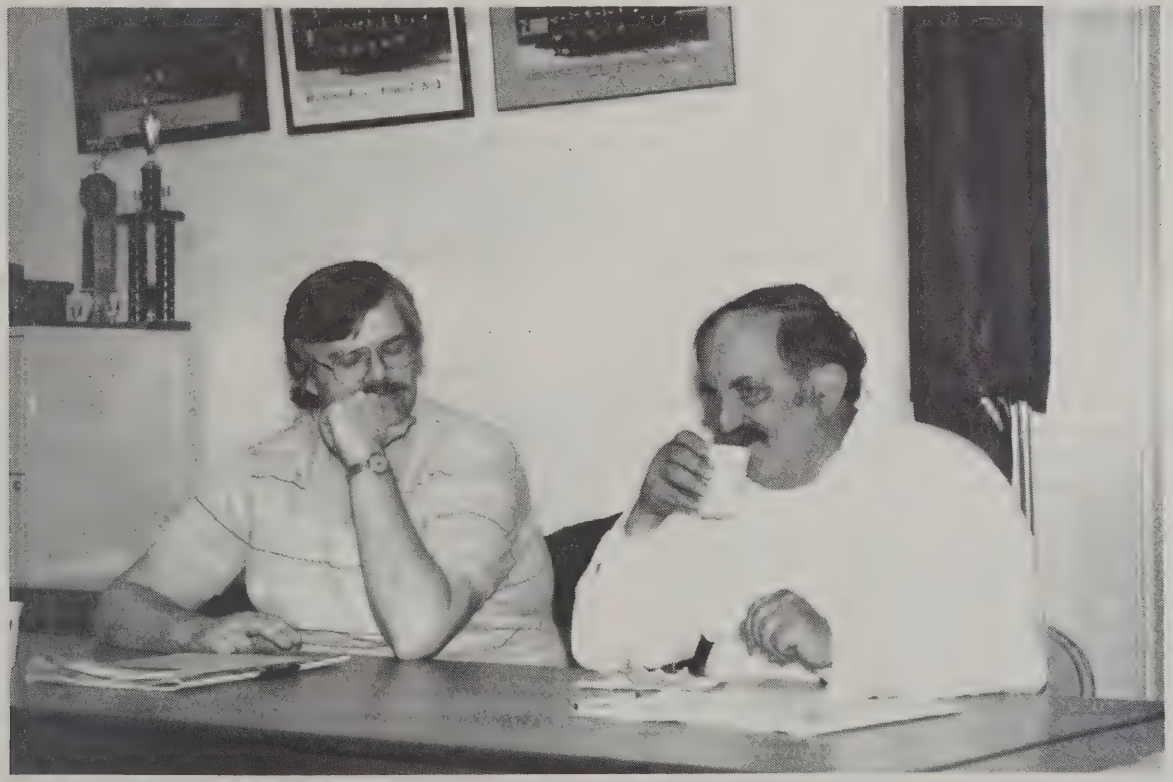

VE2RM
Antenna and Tower Plan
produced by Dino Morielli VE2EK rev. 06/91
Beacon lights
Lightning Rod
facing south
129 feet
119ft level
120ft
123ft
444.0 MHz Repeater 8 Dipole 9 dB Array
RX: 449.0 MHz
TX: 444.0 MHz
60W RF
6M Dipole 0 dB Omni
RX:53.01 MHz
TX: 52.01 MHz
Aluminium cable supports
147.0 MHz Repeater and Packet 4 Dipole Array 6 dB Omni
RX: 146.40 MHz
145.01 MHz
147.60 MHz*
TX: 147.00 MHz, 25W
145.01 MHz, 20W
108ft
110ft
Commercial Low-Band 3 dB Omni
RX: 48.42 MHz
TX: 49.92 MHz
60W RF
RX: 446.025 MHz
TX: 441.025 MHz
UHF Packet Backbone 4 Dipole 6 dB Array
polytstrand nylon guy wire
224.98 Mhz Repeater 4 Dipole Array 6 dB Omni
RX: 223.38 MHz
TX: 224.98 MHz
60W RF
S.R. Telecom microwave horns
93ft
89ft
97ft
87ft
83ft
29 MHz Dipole 0 dB Omni
RX/TX= 29.5 or 29.6MHz FM
60 W RF
Phone Patch
UHF Link
10W RF
UHF Packet
User Port
RX: 446.050 Mhz*
TX: 441.050 MHz*
85ft
80 foot level
81ft
UHF Corner Antennas 10 dB gain Directional
Top view of tower with arrows showing azimuths of existing antennas.
N
UHF Arrays & Corner reflectors
6M & Low Band
144, 220, & 29Mhz
Viewed from different angles for the purpose of this illustation.
*= proposed
Drawing not to scale

Photographs from Spring Board Meeting

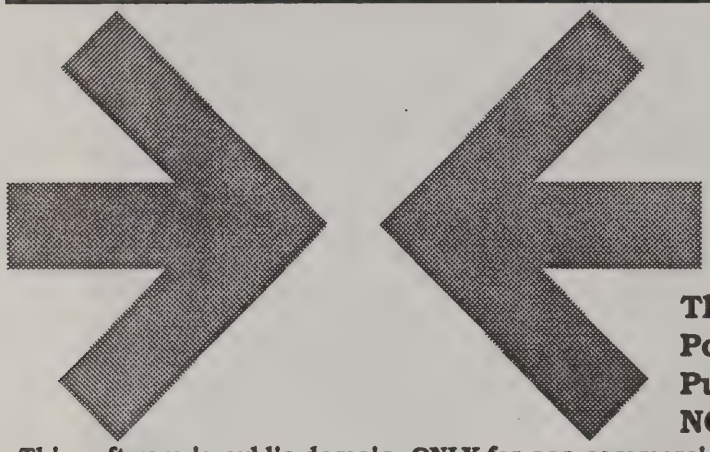
Board Member Linds Collins NR1N

During a break Cal and Cal are showing Dana (just out of the picture on the left) the packet map they've put together. In the picture are, from left to right, Cal W1JFP, Rus WA1TLN, Chan KA1OU and Cal WA1WOK.

Board Members Cal Stiles W1JFP on the left and Dana Jonas WA2WNI on the right. Rich Place WB2JLR standing up is opening the meeting as chairman.



Board Members Kevin Wright WA2VAM on the left and Jim Wzorek K1MEA on the right.



TheNET and TheNET Plus
Portable. Compatible.
Public Domain.
NORD><LINK

TheNET Plus Node Op Resource Manual

For version 2.08B
March 1990
Programming: Bill Beech, NJ7P
Documentation:

Jack Taylor	N7OO
Dana Jonas	WA2WNI
Tadd Torborg	KA2DEW

Edited by KA2DEW

The following documentation is a product of several hams. N7OO originally documented the TheNET Plus product by NJ7P. WA2WNI and KA2DEW, both NEDA members, edited the N7OO document to produce the *Resource Manual* in March 1991. Later KA2DEW did major modifications to the document, adding the *Theory of Operations* section and the *Common Problems* section as well as many paragraphs in all of the remaining sections. This document is first released in the Spring *NEDA Quarterly* of 1991 (v2.2).

The following provides an excellent overview of Networking and nodes as known by the amateur community presently experimenting with TheNET nodes. It is important to remember however that **many** nodes outside the NEDA network are implemented without a specific plan of participation in a controlled, Hidden Transmitter Free backbone connected multi-service network. The hidden transmitter free dedicated link backbone is in essence the key element to the NEDA system.

Forward

For a long time there has been a need for a practical NodeOp manual. While the material presented herein is primarily for those desiring to set up and operate a TheNET Plus node, the methodology and procedures should apply to the operation of any of the netnodes. There are bound to be areas lightly covered, or overlooked. No doubt others will have differing opinions on some topics. Our goal here is to provide detailed and factual information on the art of NodeOping.

TheNET Plus Versions

v2.00 was the prototype test node. The maximum number of calls listed in the Heard list was 10 over a 10 minute period.

v2.01 was the first "official release" of TheNET Plus. The Heard list was changed to a maximum of 20 calls listed over a 15 minute period. A parameter was added which allowed the NodeOp to set the maximum number in the Heard list to a value less than 20, if desired.

v2.02 was not released.

v2.03 was identical to v2.01 with the exception of a bug fix associated with Parameter 24. In v2.01 if callsign verification was turned off, it also disabled the N * function. v2.03 corrects this situation.

v2.04 corrected a problem caused by the fix in version 2.03 and changed Parameters 28, 29, and 30 to agree with the SETPLUS utility and this document.

v2.05 added several new NodeOp convenience features. One was to have the STA LED light when someone connected to the node. It was felt this would assist the NodeOp in servicing his equipment while at the site. Another new feature was to add three sysop KEY commands, MARK, SPACE and DIDDLE which keys the transmitter and turns on appropriate alignment tones. Also added was an ON - OFF remote control capability. One of the NODE command responses was changed to **Host busy**, instead of **Host table full** when a user attempted to connect to the host (a non-allowable function when the host port is active). The **Not Found** response to an unknown node now indicates **Not Found: <node alias>** to assist those running multiple streams in identifying which stream is which.

v2.06 corrects a long standing routing display anomaly, which takes care of the last known problem.

v2.07 was not released.

v2.08 adds connect command disable, #node propagate disable option, adds broadcast via port options and reorders parm list.

v2.08B makes ROUTES command response show both mnemonic and callsign.

Table Of Contents

Background

NORD><LINK in Germany created TheNET with the first release called TheNET Version 1.0. Equipped with the user friendly INFO feature it has become very popular with node ops around the world. With their distributions, NORD><LINK provided source code in the public domain so other programmers could do node development work.

TheNET Plus (here after called TheNET) came about after observing that the retention rate of packet newcomers was very low. One of the factors discouraging the newcomers was that they didn't know who to talk to out on the network. After considerable effort, NJ7P was able to modify the original TheNET code so the node would list users in a heard list. Further development led to some additional user features and thus, TheNET Plus was born!

This manual is intended to provide a practical guide for the new, as well as the seasoned NodeOp in setting up and operating his TheNET Plus node.

Version 2.08B Highlights

TN2.08B has the following features over those found in NORD><LINK's TheNET version 1.0:

- Aliases have been added to callsigns in the ROUTES list.
- **Not found <aliascall>** response to an unknown node (instead of a nodes dump).
- (B)ye command added.
- (H)eard command added.
- INFO section completely sysop programmable.
- TXD is remotely sysop programmable.
- STA LED lights when a user connects to the node.
- ON - OFF remote control feature added.
- Sysop KEY commands allow keying node radio with mark, space, or diddle alignment tones.
- L2 and L3 callsign lockout feature for network administration.
- PARM string shortened to 16 parameter entries.
- A Parameter has been added to allow/disallow node broadcasts on either the RS-232 or modem (radio) ports.
- A Parameter has been added to allow/disallow the propagation of the # (hidden) nodes.
- A Parameter has been added to allow/disallow CONNECT commands.

Theory of Operation

TheNET is a software package that runs in a TNC2. The purpose of the software is to control a TNC in a system of TNCs called a network. The network is usable by hams running any mode of amateur radio packet based on AX.25 protocol. The hams can utilize the network to chat in real time, access remote computers, pass traffic or perform paging and remote control. Follows is a technical description of the TheNET software.

Hardware - L1

The TNC2 is a dual port device. That is, it has two serial i/o channels. One of these i/o channels is hooked to an RS-232 driver and a D shell connector. The other i/o channel runs to the *modem disconnect header* and then to a 1200 baud modem.

The software that runs in the TNC2 is installed in a 32K EPROM and is mostly compiled C code. Some small sections are written in assembly language. Also stored in the EPROM are default parameters and text strings. Generally the text strings are not user programmable but a bit hacker could find them and change them. Text strings that exist include "**Connected to**" message, command names, "USERS" response string, beacon text and error messages. The default parameters, callsign, node name and password are programmable. Most installers of TheNET Plus 2.08B will be using the SET208.EXE program with a PC.

International Systems Organization (ISO)

The function of a TheNET node is to act as an active data *store and forward* device as well as a remote *command interpreter* for users. Communications can occur both on the modem port and on the RS-232 port at the same time. Communications is AX.25 with networking and routing operations which are written within the bounds of the ISO 7 level model. That is that the processes in the TheNET software are modularized in the following functions:

L1:I/O control and hardware;
L2:AX.25 linking;
L3:network routing;
L4:transport processor; and
L7:command processing.

Link Controller - L2

The TheNET node's link controller will accept and make AX.25 connects on either the modem or RS-232 ports. If a station connects to the TheNET node on either port the node will remember that a connection is made, the callsign of the connecting station, and the callsign that was used to connect to the node. These are saved as the address field. The node can accept the connect using the preset callsign and ssid in the EPROM or using the nodename with any of 16 ssids. Connects may be accepted by the node from the same callsign on all 17 callsign - nodename - ssid combinations at the same time. The next time a packet is received that matches that address field the node will classify the connecting station as either a user or as another node.

If the connection is a user then the user is added to the users list and any further communications is passed to the command processor. The user may interrogate the node for information that it has (see user commands) or he may command the node using the sysop commands or using CONNECT or CQ. If the user uses the CONNECT command he may establish a connection to another node or to a user from this node. This is covered later under "*Circuit*".

Routing Processor - L3

If the connection is another node then the next message that follows will contain TheNETese. TheNETese is a slang term that means that the communications has non printable characters that TheNETs understand. More on that will be covered under *Protocol*. If the node's link controller gets the TheNETese then it marks the station as a neighbor TheNET node and passes the connection information up to the routing controller. If the traffic that is received is destined to another node then the routing processor passes it back to the link controller to go out to the next neighbor node in the chain. A neighbor node is a node that this node can talk to directly, either over the RS-232 port or over the modem port.

Transport Processor - L4

If a neighbor node passes traffic to this node that is destined for this node then the routing processor passes the message to the transport processor. The transport processor is responsible for making sure that all data that originates at this node or is destined to this node makes its way across the entire path between circuited nodes. So, if I connect from this node to another node that is many sites away it is the transport processor that is responsible for seeing that the message gets there.

The transport processor gets messages from the network processor and from the command processor. The command processor is hooked to the user. Users can connect to a node and then tell it's command processor to connect to another node. Users can tell the command processor to connect to another user or server station.

Command Processor - L7

The command processor may be instructed with ASCII text commands from a user station. Much of the remainder of this manual deals with command processor functionality. The important functions needed for understanding of the remainder of "*Theory of Operations*" is that the command processor allows the user to connect to other nodes via the network over either the modem port or the RS-232 port and to stations that are not nodes over the modem port. In addition the user can request lists of:

all nodes in the routing table;
neighbor nodes;
the best three neighbor nodes for a particular node;
all L2 connected stations known to be users.

Program Start-up

The program starts up when power is applied. It lights the STA and CON LEDs for a second and then turns them off. It initializes its memory, copying default parameters unless it has what it things are valid parameters and INFO message in RAM already. Then it sends a beacon message on both the modem and RS-232 ports. The node broadcast timer is started.

Routing

When the routing processor gets a packet to send out it looks at the destination address provided by the transport processor. The destination address is the callsign of the requested destination node. The routing processor looks up the node in it's node database (routing table). It will find up to three neighbor node callsigns which are in the direction of the destination. These neighbor nodes are routes to the requested node. If the requested node is unknown the message is thrown out. The information supplied with each route is the callsign of the neighbor node, the port number of the route, the quality value associated with the path and a flag indicating that a route is already in use. If no flag is set then the router selects the highest quality route and sets its flag. The port number describes whether it's an over the radio shot or an over the RS-232 shot. This information is passed to the link manager.

Slime Trails

The router knows of up to 100 nodes (adjustable) and knows of up to 3 routes per node. If a message, whose origin node is not in the routing table, is passed to the router, the router notes what neighbor node and port sourced the message and installs the origin node and route into the routing table. This way when an answer to that message comes back through the node the node will know what to do with it. This function is called slime trailing and only happens in the event that the origin node is on the network and knows of destinations within the network, and where the network doesn't know of the origin node. Important: If the routing table already has 100 nodes in it then a slime trail cannot be added.

The reason that this function is called a slime trail is that when a user requests a copy of the routing table (nodes list) the slime trail shows up as a node with

Nodes Broadcasts

Every 30 minutes (parm adjustable) the node will send a nodes broadcast via both it's RS-232 and modem ports. This broadcast allows the neighbor nodes to maintain their databases of nodes that this node is sourcing. The broadcast consists of all of the nodes whose obsolescence counts are equal or greater than parameter 5 "Obsolescence counter, minimum for broadcast" and all of the nodes whose obsolescence counts are 0 (locked nodes). The format and order of the nodes broadcast is basically:

```
This node, PQ=256
knownnode, PQ=nodequal
knownnode, PQ=nodequal
knownnode, PQ=nodequal
...
```

nodequal is the highest of the 3 values that the node has stored for knownnode. *An interesting quirk of TheNET is that if the sysop has locked the node itself in that the node broadcast will include it as a knownnode. Because TheNET nodes believe everything that they hear in the broadcast, in the order that they hear it, the node can convince other nodes that it is of poorer quality than they have set for the route.*

Circuits

The process of connecting into a network node, across the network, and then out of the network requires three operations. The first is called an uplink. The second is called a circuit and the third is called a downlink. The uplink and downlink stages are AX.25 connections to the link processor of each of the two end nodes. The link processors pipe directly to the command processors. Circuiting means that the command processors pass the traffic to the transport processor which then passes the traffic to the router etc.. After the router in the origin node gets traffic to go to some distant destination node the traffic can hop from node to node over more than a dozen TNCs before again reaching a transport processor which will be at the destination node. The destination transport processor will then acknowledge the packet and the process is repeated in reverse. At the same time the destination transport processor acknowledges the message it sends the message to the destination command processor. If the origin transport processor hasn't gotten an acknowledgment before a time-out timer expires (transport time-out) it can resend the message. If the origin transport processor gets another message from the origin command processor it can send that one into the system as well. It can have up to 4 messages in transit without having acknowledgments. When the command processor attempts to send the 5th message the transport processor will respond with a 'choke' flag.

Preliminaries

The following steps should be taken in the process of getting your new TNPlus node operational:

TNC Selection

"Net" type chip nodes work only with TNC2s or clones. There may be a problem with noding an AEA PK88. The Kantronics series of TNCs will NOT work for this application. Multi-mode type TNCs will **not** work for this application. Use only a TNC2 or clone (Pac-Comm, MFJ) that has the full compliment of 32K memory installed. Using the older 16K equipped TNCs will result in failure of your node to work. Your TNPlus node chip is a programmed type 27C256 EPROM and replaces the TNC firmware chip located at U-23 in most TNCs. This TNC chip can be identified by the label on top indicating something to the effect of *"TNC 2 1.2.6"* or, *"TNC 2 1.2.7"*.

CAUTION! *CMOS handling precautions are necessary when removing/installing these chips. Never replace components with power applied. The safest procedure is to ground yourself, your work area and your TNC during the chip replacement process. Keep your TheNET Plus chip in it's protective container until time to insert it into the TNC.*

Current versions of the MFJ 1270B and MFJ 1270BT as well as the PacComm Tiny-2 and MicroPower-2 TNCs come from the manufacturer TheNET compatible with no modifications needed.

Selecting Mnemonics For Node Ports

Backbone Ports

For some time now NEDA has been using the mnemonic #NEDA for the name of all its backbone ports. The reason for this was twofold: firstly this was an easy way to identify a backbone port that was a NEDA participating network link. Cooperation is rarer in amateur radio than individuality and we are proud of the cooperation in the NEDA network; and secondly this was an easy way "out" of deciding what else to name it! Various network participants who wished to show off the name of a node sponsoring group sometimes would use hidden mnemonics that related to their group, i.e.: #CNYPA for Central New York Packet Association or some other such "pound" ident like #NYEPRA, #NYSPA, #NYS01 or the like.

The reason it is possible to use the #NEDA mnemonic on all of the ports at a site is that the software does its routing using callsigns, not node names. The node names are around purely for the advantage of the human users and are not referred to except during user command processing. When the command ROUTES is given the node will respond with the callsigns of the neighbor nodes as well as the node names. On a NEDA user port all of the RS-232 neighbors (port 1) will have callsign:#NEDA.

User Ports

On user ports there is a great propensity toward displaying the band or frequency of a port in its node name or for using airport identifiers. NEDA has since steered away from this and is in fact now converting node names over to mnemonics or name tags that as accurately as possible describe, in a fashion understandable by all hams, the geographic location or nearest major city that would be readily recognized and later remembered by those finding and using the port. Bizarre mnemonics that are a play on words, club acronyms or other such labels tend to not only confuse users but are easily forgotten as to what they mean.

Another reason why fancy labels are no longer needed is that current versions of the software allow rather extensive INFO texts in which can readily give specialized information to stations accessing the port. Typically this should always include the frequency of the node, so there is little use in naming something like ALB144 or ALB220.

Preferable to this are names like ALBANY and ALBNY3. Make sure to read the information in this literature about INFO texts.

At a recent NEDA board meeting the method by which to pick labels that matched a local geographical name was discussed at length and W1JFP suggested a presently available methodology to consistently convert city names longer than 6 characters. For information on this conversion scheme send a note off to W1JFP @ W1JFP.

Specialized Ports

For dedicated links and server ports, it is a good idea to pick a label that fits either the application, or to use a abbreviated version of the site's main user port with a number after it. *Make sure the info text clearly spells out what the port is for.*

Examples of specialized ports in our network are: DXCLUS at UTICA node which is the DxCluster uplink, and DXKNOX at KNOX which is near Albany NY and serves the YCCC/AARA DxCluster run by K2TR. Give consideration to where your label will show on the list. This was one of the reasons that BBSxxx was chosen for G8BPQ and MSYS BBS ops, so that the BBS's would all be listed in the same part of the nodes table!

If you have any questions on how to set up or name a port or node, feel free to contact your nearest NEDA Technical Committee member or NRS, or send a note to NEDA @ W1NY with ATTN: NTECH in the title field.

TNC Modifications

Prior to modifying your TNC for TNPlus operation, make sure it is functioning normally. Then perform the TNC modifications. These consist of:

Connecting a small wire from RS-232 pin 23 to the "common" side of JMP 9, the three pins facing the front panel on the board. (not necessary for Tiny 2)

Perform VHF or HF DCD modifications, as appropriate. These modifications were developed and reported on by Eric Gustafson, N7CL. They yield improved TNC performance and will improve node operation. For the TAPR TNC2 or clone, the VHF modification is extremely simple and consists of adding a capacitor and two resistors to the circuit board: Replace R73 with a 180K ohm resistor. Place a 180K ohm resistor paral-leled with a .001 Mfd capacitor on the underside of U-20, between pins 3 and 6.

Note: To perform the above modification, it will be necessary to remove the TNC circuit board. An alternative method of doing these mods would be to purchase a TNC DCD modification kit from the Tucson Amateur Packet Radio group (TAPR), telephone (602) 749-9479. Specify the TNC model number when you order.

On earlier version TNC-2s it will be necessary to increase the CPU clock speed to 4.95 MHz. Check your TNC documentation on how to do this. 1990 vintage TNC's probably are already set at this clock speed. Early version TNC-2s used at U-3, an LM 324 op amp which is not fast enough for 9600 baud RS-232 operation. If your TNC does NOT have this chip it probably will operate satisfactorily. If it does have the chip. A TL074 or TL084 is a suitable replacement. Modification of the watch dog timer to increase it's time out value does not seem warranted as the 12 second timer value is sufficient. The PacComm Tiny 2 TNC comes TheNET ready but it may require a more complex DCD modification kit, also available from TAPR.

Node Radio Considerations

Radios selected for node use should be capable of heavy duty use. The Tx/Rx switch circuitry should be able to handle virtually millions of operations without failure. This means PIN diode Tx/Rx switching as a first choice followed by high quality reed relay switching. Receiver front-end filtering should be quite sharp if your node is to coexist with other radio services. In that case consider using one or two tuned cavities to cut down on front end overload and desensitization. If your radio is operating on a simplex frequency, the cavities will also aid in reducing the effects of "white noise" being generated by the transmitter. At congested sites, a circulator may be required.

Some amateur class VHF radio's employing PLL frequency synthesizer technology should be avoided. Two reasons: PLL settling time between transmit and receive is too slow for optimum packet throughput. Consider the following table.

This is a table of maximum throughput in bytes per second assuming 230 bytes of data per 256 byte transmission with a 16 byte acknowledgment, for each popular data rate and with different TxDELAY settings which would be the same on both ends of a data link:

baud	byte	Throughput given TXD of				
rate	time	0ms	40ms	250ms	350ms	500ms
1200	6.67ms	127	121	99	91	81
2400	3.33ms	254	233	163	143	121
4800	1.67ms	506	431	241	199	158
9600	.833ms	1015	750	316	248	187
56K	.104ms	8131	2124	435	316	223

Note that the actual TxDELAY setting in the TNC Parms is in tens of milliseconds. Therefore the 500ms values in this chart would be achieved by setting the TxDELAY to 50; 40ms values would be TxDELAY of 4.
The length of a single byte BYTELENGTH = 8/baudrate
The length of one byte of data, including inefficiencies is
LOADEDBYTE = [(TXD x 2transmissions) +
(BYTELENGTH x 272bytes)] / 230
Throughput per second = 1 / LOADEDBYTE

This means that the speed of the radio's transmit to receive and receive to transmit switching is vitally important. Also, the transmitter may be keyed before stabilizing on frequency. This latter situation could cause interference to other receivers on different frequencies. This may be a serious concern if you choose a commercial radio environment for your node. If your candidate radio uses PLLs, solicit the manufacturers advice on suitability for packet node use.

In general, retired commercial service FM radios, such as the Motorola MICOR and GE MASTR II, or later, make excellent node radio choices. The commercial radios are designed to operate in moderate to high intensity RF environments, are physically rugged, and fairly reasonably priced on the used market. These radios typically come in a variety of power levels up to 110 watts (suitable for long haul dedicated UHF/6m backbone links; User ports should generally run less than 25 watts ERP.)

If this information is daunting to you then please just keep it in the back of your mind. If you are running your node out of a non-commercial radio site, like your home, then you can worry about this after you have your multiport node up and running. Using ham radio HTs and mobile rigs you can get things going and then swap out critical components later. The most important thing here is that you get your multiport node up and running with hidden transmitter free backbones. Then you can worry about radio and baud rate improvements.

Node Checkout

Before placing your node in service, it is a good idea to verify modem tone frequency accuracy for each port. This can be done by using a frequency counter on the TNC audio output in conjunction with the KEY MARK and KEY SPACE commands. Or by following the modem calibration procedure using the firmware chip as described in the TNC manual. Carefully save the original TNC firmware chips for possible future use.

NOTE: Sometimes the contents previously stored in RAM memory will interfere with node initialization when the TNC is first powered ON. This situation has been observed after replacing the TNC firmware chip with the new node chip. The solution is to turn off the TNC and pull the battery jumper (JMP 5 on MFJ's) for about one minute. This power down process deletes the contents previously held in RAM memory. Reinstall the battery jumper and the TNC should initialize properly.

Using a standard RS-232 cable, such as the one between your TNC and terminal, connect your terminal to one of the TheNET TNCs. Make sure the terminal is set to the same as the TNC to terminal data rate on the TNC! (Tiny 2 data rate is set just inside the front panel. MFJ is set on the back panel) Power on the TNC. The STA and CON LED's should go on and then off. A TNPlus sign-on message will appear on your terminal's screen. Connect to the new node by pushing the esc C <enter> keys. The screen should now read:

`Connected to <callsign>`

At this time verify the node is working by checking out it's commands. Type: `I <return> H <return> N <return> P <return> R <return> S <return> U <return>`, an invalid command such as `W <return>`, and `Z <return>`. You should get an appropriate response back from each of these node commands. Operation of the node in this manner is called "host interface" and is similar to using a regular TNC in the non-monitor mode. You will not be able to monitor unconnected packets.

A unique password string has been hard burned into your "TNPlus" node chip. You will need to remember this password string since from time to time you may want to enter new material into the INFO section.

NOTE: *From version 2.05, the ESC P command has been deleted from the HOST interface. In order to make programming room available for the "KEY" alignment features it was necessary to make a trade-off between that and existing functions. As a result, it was decided to remove the ESC P command from HOST mode. The password string is still normally programmed in at time of node chip preparation and should be recorded for NodeOp use.*

You may also ***sysop*** the node by connecting to radio and then connecting to it over the radio. See "*Sysop Command List*" for more details.

Now that you are in control as the sysop, you can input the information into the INFO section. You should insert the correct information about your QTH, operating frequency, contact information and access to servers locally in the network. For specific information on how to write into the INFO section, review the material presented in the "*Sysop Command List*".

As sysop, you can also change the parameters. In fact, you changed one of them in the example above. The default node parameters have been carefully set for your node. (***It is not recommended they be changed unless you have a strong reason for doing so***) In general, the node parameters modify the nearby node network performance in subtle, and sometimes not so subtle, ways. An improperly set node parameter can harm the overall network throughput. Before making any changes, read over this manual, your NEDA Annual Membership Package, and consult with your regional network sysop.

Once you have checked out each port individually you can prepare to connect them together through the Hexi-Pus™ diode matrix. Before you do this you may want to lock in the user port node at each of the backbone port nodes and all of the backbone port nodes (at the site you are building) at the user port node. The reason for this is that the automatic nodes broadcasts are the only other way that the TNCs will find out about each other and that means you will have to wait 30 minutes after hooking the TNCs together before finding out if they are working! If you know how to lock nodes using the N command then do so. If not, hook the TNCs together through the matrix now, with the radios off or disconnected, and then continue reading until you get to that part of this manual.

User Command List

TNPlus v2.08B has the following commands available to the user: (Commands may be abbreviated as indicated.)

BYE

This command will tell the node to disconnect from the user and may be abbreviated to B. This will have a similar effect to the user doing a disconnect from his own station.

CONNECT

This command instructs the node to connect to another station. The command is entered as `C STATION` where station may be a six character or less text string or a valid amateur callsign. First the node searches it's own database for a match between *station* and a known node name or a callsign associated with a known node. If a node name match is found then the callsign associated with that node is used. If that is the case or if STATION matches a node's callsign then a network connect is attempted to the requested node.

If no match is found then the node will process STATION and determine if it is a valid callsign. If not then the node will send an error message to the user. If it was a valid callsign then a connect attempt is made via the modem port of the node. If successful the user will be sent `nodecall:nodename} Connected to STATION`. If unsuccessful the user will be sent an error message.

CQ

When the node receives a CQ command, it transmits once: CQ plus any user text up to a maximum length of 77 characters, including spaces. The node is also conditioned by this action to display the CQing station in it's USERS response for a period of time set by Parameter 15 (usually 2 hours minutes), unless the CQing station issues some other command before the time runs out. Should another station perform a USERS command during this time, he would be able to see something like this:

```
ALBANY:WA2WNI-1> NEDA Node TN208B(695)
Circuit (MONROE:WB2GNR-1 NM2J)  <~~> CQ (NM2J-15)
```

Anyone observing the CQ can connect to NM2J-15 to initiate a QSO. If you are already on a node port and see another station in the USERS list CQing you may also connect to the station directly from there. If the CQing station doesn't get a reply after a few minutes, he can resend the CQ command from time to time in hopes of attracting someone in the local area of the calling node. Remember, each time the CQ command plus text is given it will be broadcast in unproto form by the node for just that one time.

HEARD

The "H" command will display level 2 (normal) users heard by the node during the past 15 minute period. Netnodes and level 3 users will not normally be seen once your node has "initialized" itself (a 30 minute period after start-up). The maximum number of users allocated for the HEARD table is 20. Stations listed in the HEARD table are not ranked in order of time. I.e., the first station listed may not be either the most recent or the oldest station heard. If a station has not been heard during the past 15 minutes, a `No One` response is given.

The HEARD function compares the new call with the node routing table. If a match is not made, the new call will appear on the HEARD list. There will be times when either a new node or a propagated node callsign will appear on the HEARD list. Following receipt of a node broadcast containing the alias for that particular node, the node callsign will then be deleted.

Digipeated and local node downlink callsigns will also be listed. If a user notes an SSID of -14 or -15 associated with the callsign, the odds are these calls will be unconnectible since the originating station is separated by one or more digi's or nodes. Stations who are digipeated will probably not be connectable and the HEARD list won't make this clear.

INFO

Sending this command will make the node respond with a block of text that will describe the node's location, frequency, who to contact, servers accessible etcetera. Examples of info messages are:

```
WB2QBQ-1:KNOX}
port  144.91 USER
cnty  Albany
QTH   Knox, N.Y.
info  WB2QBQ @ WA2PVV
Use C CROWD command at this port for local
Keyboard QSO's!

K2TR-10:DXKNOX}
Port  Dedicated DxCluster Link
cnty  Albany
QTH   Knox, N.Y.
info  WB2QBQ @ WA2PVV
Enter  C K2TR for direct connect to  YCCC/AARA
DxCluster System.

N2CJ-1:CLV}
Port  145.09 MHz USER
cnty  Duchess
QTH   Clove Mt. Poughkeepsie, NY
info  N2CJ @ WB2COY
For automatic routing to WB2COY BBS via dedicated
link enter  C BBSCOY
```

NODES

This command returns a listing of the nodes contained in the routing table. It gives a user a listing of possible destination nodes for him to connect to. It's a very good practice to use this command at least once every few weeks on your local node to learn about network changes. Feel free to connect to new nodes on the list and issue the INFO command to learn all about the new node.

Variations on the N command are: **N *** and **N <alias or callsign>**. The **N *** command additionally yields a dump of the # (hidden) nodes. The hidden nodes are those normally associated with backbone trunking. As such it is not normally intended for users to connect to them.

The N command can be used to determine the neighbor node and quality for a particular node. The syntax is **N <alias or callsign>**. An example:

We are at the CANTON node and wish to know the route to POTSDM. We issue a **N POTSDM** command and receive back this response:

```
CANTON:WA2MZF-5} Routes to: POTSDM:K2CC-1
> 186 3 1 #NEDA:WA2MZF-11
  167 3 1 #NEDA:WA2MZF-10
```

This tells us there is a route to POTSDM and it is an RS-232 path (the 1) via WA2MZF-11 which is a backbone node and this route is currently in use. The numbers given in the N <alias or call> command will be explained later. Here we just want to show how the N <alias or call> command is a powerful tool to help one navigate throughout the network.

PARMS

(Parameters) Issuing this command will yield a status listing of the nodes parameters. There are 33 although only 16 are answered with by the PARMS command. The other 17 are only visible during node EPROM setup.

The node response may look like this:

```
POTSDM:K2CC-1} 50 50 230 3 4 1800 6 1 8 0 1 0 35
2 0 1
```

Each parameter affects the node operation in one way or another. The values chosen for your node will impact the operation of the other nodes in the network. The convention is to number the parameters from left to right in the example above, starting 1, 2, 3, etc. See the section titled *Node Parameters* for a complete description of the parameters.

ROUTES

This command yields a listing of all radio line of sight or wire connected nodes *known* to the node. These nodes are called *neighbors*. The listing will also show nodes and digi routes set by the sysop locking commands. Due to the different protocols involved, TheNET does not recognize KA-Nodes, ROSE nodes, or TEXNET nodes in it's ROUTES list. It will recognize G8BPQ, MSYS and compatible TCP/IP nodes. A typical ROUTES display may look like this:

```
CANTON:WA2MZF-5} Routes:
  1 #NEDA:WA2MZF-12 230 16
  1 #NEDA:WA2MZF-10 230 3
> 1 #NEDA:WA2MZF-11 230 12
  0 HULL:VE2RBH 50 1
```

In column one we see a 1 for all paths that are through the matrix and a 0 indicating a radio path to VE2RBH, HULL node. The right arrow indicator tells us one of the paths is either in use or has had activity within the past 15 minutes. All radio paths show a standard path quality value of 50 (This is a standard *user* port). All RS-232 paths show a path quality value of 230. The last column indicates the number of nodes sourced from this route.

Sysop Command List

In addition to the **user** command listing given above there are a special set of commands for System Operator use. To be able to use these, you will have to be recognized by the node as a sysop. The method for doing this is to answer correctly the random set of numbers given in response to a SYSOP command as described previously.

SYSOP

After connecting to the node by issuing a "C callsign" command, type "S". S will return you a random series of 5 numbers. Enter the password string that corresponds to these numbers. The node will **not** tell you that you have been successful. To test the success of your SYSOP command, type "P <return>". This will give you a string of numbers, representing the default values for the various node parameters. Note the value of the first number (typically 50). Now type **P 51**. If successful, the first number should come back reading the new value 51. Again type **P** space and insert the original number back in the parameter listing (**P 50**).

Sample password string:

```
FRED WAS A BIG HERO AROUND HERE UNTIL TH
```

I usually write out my password strings in a matrix so they are easy to translate. Thus:

```
   x0 x1 x2 x3 x4 x5 x6 x7 x8 x9
0x !! F  R  E  D     W  A  S
1x A     B  I  G     H  E  R  O
2x    A  R  O  U  N  D     H  E
3x R  E     U  N  T  I  L     T
4x H
```

Remember that the first valid digit is 01. So, the fallowing exchange would properly sysop the node:

```
cmd: C MITOM
*** Connected to MITOM
SYSOP
K1MEA-1:MITOM} 31 13 40 01 08
REHFS
```

Note that the node will not return a number that represents a space character. To verify that I got in I type:

```
P
K1MEA-1:MITOM} 50 50 230 3 4 1800 6 1 8 0 1 0 35
2 0 1
P 51
K1MEA-1:MITOM} 51 50 230 3 4 1800 6 1 8 0 1 0 35
2 0 1
P 50
K1MEA-1:MITOM} 50 50 230 3 4 1800 6 1 8 0 1 0 35
2 0 1
```

Note that the first parameter changes from 50 to 51 and back to 50. It is very important that the parameter is changed back! So, if you do this procedure don't change the first parameter by too much. If you were to change it to 255 and then weren't able to change it back (Your tower just blew down) the node would soon become useless.

INFO

Allows the sysop to enter text into the soft coded INFO section on the node. This new INFO section has available a maximum of 160 characters. Up to 80 characters on one line is allowed. It is always a good idea to start any info string with a blank line feed to allow your info text message to be formatted nicely on the user's screen. This is done by entering a `I <ctrl A> <return>` for the first line. Note that a "I" followed by just a ctrl A will blank the entire info message. For text to be entered on the 2nd and subsequent lines, type: `I +<text>` until the total 160 character limit is reached.

As this technique is different than previously used, a little in-house practice is advised until you become familiar with it. Review the INFO format examples previously given for ideas on how you want to set the INFO text format. An example for setting INFO:

Sysop action: `I ctrl A <return>`

Node response:

```
ALBANY:WA2WNI-1}
```

Sysop action: `I +port 144.93 USER`

Node response:

```
ALBANY:WA2WNI-1}
port 144.93 USER
```

Sysop action: `I +cnty Rensselaer`

Node response:

```
ALBANY:WA2WNI-1}
port 144.93 USER
cnty Rensselaer
```

Sysop action: `I +QTH West Grafton, N.Y.`

Node response:

```
ALBANY:WA2WNI-1}
port 144.93 USER
cnty Rensselaer
QTH West Grafton, N.Y.
```

Sysop action: `I +info WA2WNI @ WA2PVV or NEDA @ W1NY`

Node response:

```
ALBANY:WA2WNI-1}
port 144.93 USER
cnty Rensselaer
QTH West Grafton, N.Y.
info WA2WNI @ WA2PVV or NEDA @ W1NY
```

This process can be repeated until the maximum of 160 characters, including non-typing and punctuation, has been reached.

Note that the key things to tell your connecting stations are: What frequency the port is on, What type of port it is, Where it is located, and how further information can be obtained.

NEDA Node sponsors who are not readily reachable by packet may also put NEDA @ W1NY in the info line at the bottom if they wish. NEDA *promotes* live keyboard user activity and "hacking" the network to find out what's out there and to find new friends and ways of using the network. Nothing can be more frustrating to a user ham to find a nicely implemented reliable network port that has a blank info text! Lets prevent this annoyance by carefully labeling every port that is put up and what services it is intended to perform!

For further information regarding info texts and setup contact your nearest NEDA NRS or send to NEDA @ W1NY attn: NTECH Committee.

KEY

KEY MARK; KEY SPACE or KEY DIDDLE

Operates the PTT line of the TNC and turns on the Mark (high) tone, the Space (low) tone or a diddling between the two tones for approximately 22 seconds.

The purpose of the "KEY" commands are to make the NodeOp's job of setting deviation and RF frequency much easier. Previously it was necessary to reinstall the original TNC firmware chip and perform the CALIBRA procedure in order to set FM deviation. Now if the node-op has the appropriate equipment and is within radio range of the node, he can routinely check frequency and deviation remotely! At the site, this same procedure can be done via the host mode interconnect. Once entered, there is no way the KEY command can be terminated until the internal timer runs it's course. If the node watchdog timer is set for less than a 22 second duration, the watchdog will unkey the PTT. However, the node will continue the KEY command until the remaining time has expired. During this period, the node will not execute any other commands.

ON - OFF

A simplified remote control capability as compared with the HIGH LOW commands found in TheNET version 1.0.

ON turns on the CON LED and *OFF* turns the LED off. In the MFJ 1270B, the voltage sense from the CON LED appears on pin 8 of the DB25 connector. The voltage sense also appears on the base of Q16, a 2N3904, the output of which goes to pin 2 of the TTL connector. The main caution here is that the control switch be capable of passing the appropriate amount of current and voltage to the controlled device.

PARMS

Allows the sysop to make changes to parameters.

To use, type `P ********** 650 <enter>` to change parameter 15 from 900 to 650, for instance. The asterisks preceding the value to be changed protects the preceding parameters from being changed. To change Parameter 4, type

```
P *** 245.
```

NODES

Occasionally a need may arise to modify node entries in the node routing table. The sysop command for this is:

```
N NODECALLSIGN + ALIAS QUALITY OBS PORT NEIGHBOR
(digicall1, digicall2)
```

For example:

```
N WA2TVE-8 + DXCLUS 58 0 1 WA2WNI-7
```

In this example the node DXCLUS:WA2TVE-8 is added to the nodes list with the node name of DXCLUS with a route quality of 58, and obsolescence of 0 (thus locking in the node) via the RS-232 port (the 1) and routed to WA2WNI-7 as the neighbor. Setting the obsolescence to a non zero value will cause this planted node information to be temporary

To manually unlock DXCLUS, the command is reversed:

```
N WA2TVE-8 - DXCLUS 58 0 1 WA2WNI-7
```

Note that you can manually remove other nodes even non locked ones, at least temporarily, by using this command. The values you use for quality, obsolescence, port and neighbor must be entered exactly as stored in the nodes list.

Here you will note, we used a minus sign for this purpose. It is necessary that the unlock command be exactly the same as the lock command, with the exception of the minus sign.

Setting the obsolescence to zero permanently locks the destination node into your node routing table. Even if the locked node fails, it will still be listed in the node routing table. A failed node entered as a locked route on the other hand, will not be listed in the node routing table if a corresponding locked nodes command has not been used.

Note that if 3 neighbors report a higher quality than your locked quality in a locked node, that your locked entry will be shoved off the nodes list and will not be remembered.

The locked nodes command to use if a node should NOT have an alias is:

```
N NODECALL + * QUALITY OBS PORT NEIGHBOR
(digicall1, digicall2)
```

Usage example: `N AK7Z-1 + * 143 0 0 AK7Z-1`

ROUTES

This command allows routes to specific neighbor nodes to be locked in or changed. There may be times a node-op will want to modify the path quality value of a route to a given node. The locked routes command is:

```
R PORT NODECALL (digicall1, digicall2) +
PATHQUALITY
```

To unlock the routes use:

```
R PORT NODECALL (digicall1, digicall2) -
PATHQUALITY
```

An optional use of up to two digi's can be specified. An example:

```
R 0 N2CGY-3 + 143 WA2JWJ-1 W5ODA N5AA
```

The result of this operation might look like:

```
MAL:W2RRY-1 Routes}
0 DKC:W5YI 50 9
0 CLOUD:W2VXY 192 43
0 WMASS:N2CGY-3 via WA2JWJ-1, W5ODA, N5AA 143 1!
```

Here we see the exclamation mark which indicates a SYSOP locked entry.

The most common example of locked routes is in a backbone link which is supposed to be protected and dual ended. You may lock in the neighbor route and set the radio channel 0 path quality (Parm 3) to zero. This protects against unauthorized backbone use or misrouting caused by propagation or DX. The wanted routes would then be locked in at quality 230. This means that all nodes sourced from the neighbor will have routing qualities based on the 230. See the NEDA Annual Membership Package for more information on route quality calculations.

```
0 DKC:W5YI 50 9
```

In the routes list the second value after the neighbor callsign (in this case =9) is the number of nodes sourced from the listed route. If a route is locked this value may be 0, indicating that no nodes are sourced from the neighbor.

Changing the value of an established (but not locked) route may also be done with the routes minus command. Note that attempts to remove a route which is sourcing nodes will not be effective. The best you can achieve is to set the route quality to 0. If a node is locked using a route you want to remove you must first unlock the node. If a node is locked to a neighbor for which there is no route, a route will be created automatically at the quality with which the locked node is set.

RESET

This command causes the routes table and nodes table to be cleared, along with the info message. Any currently connected users are lost.

Host Interface

When as Node Op, you connect your terminal to the RS-232 port of your node, you are accessing the host interface. It's function is to allow you as, node-op to perform housekeeping operations. The node is configured to automatically accept you as the authorized sysop whenever it senses your terminal connection.

In addition to the regular user commands, the host interface has specific host commands available. These are:

ESC C - to connect to the node.

ESC D - to disconnect from the node

While accessing the host interface, you can (without qualification) perform all the other sysop functions that are available to you remotely. The host interface is set up as a single user application. You, as sysop can access it by giving an ESC C command via a terminal connected to the RS-232 port. A user can access only if there is no one ac-

tively connected to the node via the RS-232 port **and** if parameter 12 is set to (1). Under these circumstances a user would connect to the node as normally done. Once the `Connected to` response is received, the user would enter another "C" command. The node will then respond again with `Connected to <nodecall>`. At this time communications can take place between the user and the host terminal.

Node Parameters

The values given in [brackets] are current default for NEDA Network U=USER B=BKBN type ports.

1. Minimum path quality for automatic updates.

This parameter sets the minimum value for quality for a node to be saved into the routes table. When a node hears a nodes broadcast from a neighbor node it processes that broadcast in terms of the quality value associated with that neighbor node. Any nodes learned about whose resultant quality is less than parameter #1 are ignored. If the path quality to all backbone nodes is the same, regardless of path type or port number the length of the network can be predicted based on the path quality and parameter number 1. NEDA recommends 50 for this value and 230 for all path qualities. This limits the duration in terms of number of nodes to 8, multiport, dedicated link supported, nodes.

(Range: 0 - 255) U - [50] B - [50]

2. Path quality assigned to radio channel 0 (HDLC port).

In a system where time to live (Parameter 18) is used to determine the number of backbone hops away from which this node will be available this parameter, HDLC default quality, should be consistent on all backbone ports. The NEDA Network consistently uses 230. For *user* ports a value of 50 is used so that nodes appearing from outside the network will show on the local user port. On LAN ports this parameter is set to 0 so that miscreant nodes do not show up.

(Range: 0 - 255) U - [50] B - [230]

3. Path quality assigned to RS-232 channel 1.

This value is set to 230 on all TNCs so that time to live may be used as noted above. Do not set this parameter to 255 as in a 3 or more port node this can cause feedback loops where bad node information may linger for extended lengths of time. See NEDA Annual Membership Package for more information on path quality and time to live parameters.

(Range: 0 - 255) U - [230] B - [230]

4. Obsolescence counter initialization value.

The obsolescence is the number of nodes broadcasts before the node information for a particular node is erased from the nodes list unless updated by a new nodes broadcast from the appropriate neighbor.

(Range: 0 - 255) U - [3] B - [3]

5. Obsolescence counter, minimum for broadcast.

This sets the limit on the minimum obsolescence value associated with each node for it to be included in the nodes broadcast. The node doing the broadcasting is always included in the broadcast.

(Range: 1 - 255) U - [4] B - [1]

U value only passes itself, B value will allow all currently known nodes to be broadcast

6. Broadcast timer interval in seconds.

A TheNET node TNC has an internal timer. This value sets that timer. When the timer runs out the node decrements the obsolescence counts for all of the nodes in it's nodes table and does a node broadcast.

Whatever value is set, it should be the same as that of the neighbor nodes. Otherwise it is apt to adversely impact the operation of some of the previously discussed parameters. In other words, indicate poorer paths then what really exists if set for a shorter time interval than the neighbors. The opposite is true if this timer is set for longer periods. It may indicate good paths that in reality have gone away.

(Range: 0 - 65535) U - [1800] B - [1800]

7. Link time-out (FRACK).

This sets the time delay after a message is sent to a user or neighbor node before the node will attempt a retry. For double ended hidden transmitter free backbones this should be set to a minimum value, 1. For *user* ports, setting this value higher gives priority to those users that are most consistent into the node.

(Range: 1 - 15) U - [3 to 6] B - [1]

User port value depends on channel loading/sharing required

8. Link layer MAXframe.

This sets the number of packets that are available in memory to send to a user or adjacent node that will be sent in one transmission. See NEDA Membership Package for further information regarding this parm.

(Range: 1 - 7) U - [1] B - [1]

This value insures equal network wide loading characteristics regardless of the type of application requesting a circuit. This insures that All applications get uniform network response

9. Link Layer Maximum retries.

(Range: 0 - 127) U - [6 to 10] B - [8 to 14]

Depends on channel loading/sharing characteristics

10. Digipeating.

If this function is enabled(1), it allows users to subvert the normal network flow by assigning priority to the digipeating station. The default of disabled(0) is recommended.

(Range: 0 - 1) U - [0] B - [0]

See the NEDA Membership package for info on why it is important to have this value OFF.

11. Validate callsigns.

A user, upon misstyping a C ALIAS command, will have to wait for a period of time dictated by link layer FRACK and retries before being informed of a failure. If *enabled*, he would only have to wait for the period of network propagation delay before getting an **Invalid callsign** response. In some cases, this could save the distant user 10 to 15 minutes. If the NodeOp is desiring to allow users to downlink to KA-node aliases, possibly these aliases could be named so they will satisfy the callsign verification criteria. I.e., no more than 6 characters with one number included. For example: CDXB0X (note the zero in "B0X"). Callsign validation *enabled* also prevents those who forget to install their callsign into the TNC from uplinking to the node. The node response to a N0CALL is **Node busy**. Default is "1".

(Range: 0 - 1) U - [1] B - [1]

12. Host Mode connects.

ON (1), OFF (0).

When a NodeOp has a terminal connected via the RS-232 Host Interface, ON (1) will allow users to connect to him IF he is not actively connected to the node at the time. Off (0) prevents users from connecting.

(Range: 0 - 1) U - [0] B - [0]

13. Node radio TXD.

TxDELAY in a TheNET node is the same as TxDELAY in a TNC2. This adjusts the period of time between keying thre transmitter and when it actually starts sending data. If this value is too short the receiving station will not hear the start of the packet and a failure will result. If this value is too long then data throughput will be less than optimal. TxDELAY is adjustable in 10 MS increments.

(Range: 0 - 255) U - [35] B - [5 to 35]

User ports should not be shorter than 35 or you will exclude stations with slower switching radios from using your user port. Backbone ports should be optimized to find the absolute lowest value that will work reliably with all other radios on its backbone link, then bump the number up a few notches so switching delay drift doesn't interfere with reliable Tx/Rx switching.

14. Broadcast via port.

Nodes broadcasts occur once each half hour (depending on nodes broadcast interval parameter). This parameter allows the sysop to disable nodes broadcasting on one or both ports. The reasons that this might be done is to • discourage node operation on the modem port and reduce clutter on the frequency or • hide the node or • in concert with locking the node in at another location this can be used to create a gateway or dedicated use link.

0 = Broadcasts disabled on all ports.

1 = Broadcasts enabled on port 0 (radio) only.

2 = Broadcasts enabled on port 1 (RS-232) only.

3 = Broadcasts enabled on both ports 0 and 1

(Range: 0 - 3) U - [2,3] B - [3]

15. Hidden Node Propagation.

This causes # nodes to either be propagated or not. # nodes are usually used for backbone links. In the NEDA network there are about 60 user ports and about 100 backbone ports. As the TheNET node can only afford to have about 90 nodes in it's node routing table it would be impossible for a single TheNET node to have the entire network in its table at the same time if # nodes were to be listed. This command is normally left off in the NEDA network. Also keeping this parameter turned off reduces the length of a nodes broadcast if there are any # nodes in the local system.

(Range 0 or 1) U - [0] B - [0]

16. Connect Command Enable.

If set to 0 connect commands typed after connecting to a node are quietly ignored. This prevents stations from doing manual L2 connects from a backbone node.

(Range 0 or 1) U - [1] B - [0]

17. Maximum number of nodes in NODES list.

Both hidden and non-hidden, in the node routing table. If this number is set too low, say to 1, you will limit the number of neighbor routes that show up in your ROUTES table. In other words, your node will not recognize more than one network node.

(Range: 1 - 400) U - [100] B - [100]

18. Time to live.

This is the number of node hops that a message from this node can go before it is killed. Each message transmitted through the network by a node has an associated time to live. Each time the message is received and retransmitted by any TheNET node the time to live for that packet is message is decremented. If the time to live reaches 0 the message is thrown out. This parm sets the time to live start value for each message originated by this node.

(Range: 0 - 255) U - [18] B - [18]

19. Transport layer time-out.

Sets the number of seconds that your local user port will wait before retrying a packet across the network. In this time the destination user port must acknowledge the packet and that acknowledgment must make it back to the origin user port. If the packet is retried there will be a second redundant copy of the message heading across the network even if the first copy successfully arrived. This value must be set to the maximum amount of time that it will take for a packet to travel the number of hops as set by parm 18 and parms 1, 2 and 3 and for the acknowledgment to return to the node of origin.

(Range: 5 - 600) U - [300] B - [300]

This gives a 6 minute time-out

20. Maximum transport layer tries.

Sets the number of copies of a given packet that the origin user port will send into the network to the destination user port, timed by parm 19, before declaring the path disconnected. Hopefully the TheNET software in conjunction with nodes routing information will be able to try alternate paths to achieve a response from the destination node.

(Range: 2 - 127) U - [2] B - [2]

21. Transport layer acknowledge time.

This is the amount of time a port waits before acknowledging a transport layer packet that was received. Faster is better here unless the port will be under continuous heavy loading from the same destination node.

(Range: 1 - 60) U - [1] B - [1]

Faster is better here unless the port will be under continuous heavy loading, then a value of 2 or 3 is appropriate to allow the link to "piggyback" thru data with the acks.

22. Transport layer busy delay.

In the event that a transport layer circuit cannot handle more data (parm 24) a busy flag is generated. This parameter is the number of seconds that the origin node waits before retrying a message that was lost due to the busy condition. When the busy node clears it also generates a packet back to the origin node announcing that it is clear.

(Range: 1 - 1000) U - [180] B - [180]

This equals 3 minutes

23. Transport layer window size.

This is the number of unacknowledged packets that can be outstanding for a given circuit (each user connect).

(Range: 1 - 127) U - [4] B - [4]

24. Congestion control threshold.

This is the number of packets that can be buffered in a user port for a given circuit.

(Range: 1 - 127) U - [4] B - [4]

25. No-activity timer.

This is how long a user may stay connected with no traffic flowing between the node and his station. On version 2.05 and later also sets the life of the node STA light following the last user disconnect.

(Range: 0 - 65535) U - [7200] B - [900]

The higher value on a user port here allows users to hang out on CROWD ports and special servers i.e.: DxClusters for extended periods without being tossed off for lack of activity.

26. P-persistence.

This figure determines the aggressiveness of the TNC's transmit function. A high value of P-persistence will cause the TNC to be very aggressive. If there are more than 2 TNCs waiting to transmit on a single channel and their P-persistence is set incorrectly the data throughput will suffer. A formula used to calculate ideal P-persistence is Pp = (256/N-1)-1 where N is the number of TNCs on the channel that could have data to go out at the same time. So, if the channel only has two TNCs the P-persist could be set to 255. If the number of TNCs is 3 then P-persist could be set to 127.

(Range: 0 - 255) U - [32 to 255] B - [255]

User ports depend on type of port and if it is shared by other nodes within direct RF connect range. Backbone port value assumes dedicated end to end HTS free link.

27. Slot time.

This value should equal the TxDELAY for the node plus the worst response delay for other stations on the frequency. For dedicated point to point links (2 radios on a frequency) this value is unimportant as P-persistence when set to 255 overrides the value of slot time. As with parm 26 this value depends on the type of application. Parameters 26 and 27 work together to set up a random delay determining when the node will key up following a DCD decision that the channel is clear. This is an anti-collision technique. When the node is ready to transmit, a number between 0 and 255 is internally generated. If the random number is equal or less than the value set by Parameter 26, the node keys immediately upon sensing a clear channel. If the internally generated number is greater than the value of Parameter 26, the node waits for a period of time equal to the slot time and then internally generates a new number, etc. A value of 63(+1) is 25% of 255(+1) and thus sets the percentage of time the node will immediately keyup. Protected trunking nodes (those with only one transmitter on their receive frequency) would have faster throughput if there were no node keyup delay. Setting parameter 26 to a value of 255 will accomplish this.

(Range 0 - 127) U or B - [TxDELAY of radio]

28. Link Layer time-out (Resp Time).

10s of miliseconds between receiving a packet from a neighbor node or user before the node will acknowledge a packet. This is actually the *response* time in Ms. Setting this value too low on a user port will prevent some users from being able to access the port as older radios and some newer rigs with very slow locking synthesizers will not recover from transmit fast enough.

(Range: 0 - 6000) U - [75 to 100] B - [15 to 35]

29. Link time-out timer (CHECK).

This parameter sets an idle link timer. If a link is inactive for this amount of time a check packet is sent to make sure the other end is still there.

(Range: 0 - 65535) U - [65000] B - [65000]

30. Station ID beacons.

Either ENABLED (2), CONDITIONAL (1), or DISABLED (0). This directs the node to ID either every 10 minutes, only after activity, or only imbedded in AX.25 packets. If the node is addressed using the mnemonic by users it will not be properly identified with the AX.25 packets and must be set in either the ENABLED or CONDITIONAL for user ports. For backbones each node is only addressed by callsign so ID beacons may be disabled.

(Range: 0 - 2) U - [1] B - [0]

31. CQ broadcasts.

ENABLED (1), DISABLED (0). Disabling this feature means the unproto CQ user text will not be broadcast by the node. The CQing user will still be able to be seen by someone doing a USERS command during the time the CQ is active.

(Range: 0 - 1) U - [1] B - [0]

32. Heard list length.

Sets the maximum limit on the number of stations that can be listed in the Heard table.

(Range: 1 - 20) U - [20] B - [4]

33. Full Duplex

ON (1) or OFF (0)

This option is only turned on if a full duplex radio set is employed for a backbone.

(Range: 0 - 1) U - [0] B - [0]

Hardware For Node Construction

Dual Port Operation

See the NEDA Annual Membership package for more information on node construction. Briefly, to make a dual port node operate using MFJ-1270B TNC's you will need to make a cable using a pair of DB25 connectors. To do a dual port using Tiny-2s you'll need to make a cable using a pair of DB9 connectors. Here are the schematics:

Multiport Operation

Multiple TNCs and radios can be interconnected to form a "node stack". A diode matrix is used to route the signals in proper sequence between the TNCs. The NEDA HexiPus™ is a 6 port commercial grade kit containing diodes PC board and DB9 connectors that attach directly to the PC board. This product greatly simplifies assembly of a multi port network node. To get a HexiPus™ send a check or money order for $33.93 (for U.S. delivery only) to NEDA PO BOX 563 Manchester, NH. 03105-0563.

Common Problems

Read this before you launch the missiles.

•••If the node is doing funny things like:

- only working over the radio or only working over RS-232
- not responding at all
- using the wrong callsign or node name
- transmitting all the time
- not handling the LEDs right
- disconnecting everybody once in a while
- never nodes broadcasting or ignoring incoming broadcasts entirely

Try sysopping the node and using RESET or if you have local access you can turn off the TNC, remove the battery jumper for more than 30 seconds, replace the jumper and then turn the TNC back on.

•••If your new node stack doesn't allow you to connect across the matrix, make sure that you have waited long enough for nodes broadcasts to work. The nodes broadcasts over the matrix happen at the same time they do over the radio. Just because the TNCs are stacked they don't necessarily know about each other. It is possible using the Sysop:Node command to lock in each port in your node stack to each other port so they begin communications immediately. This is a good way to get used to doing sysop commands.

•••If you have any other problems or figure out a problem for yourselves make sure you send a message about this to NEDA@W1NY attn.: tech documentation.

In keeping with the high standards set by the NORD><LINK people, the production of TheNET Plus is placed in the public domain with the understanding it is NOT to be used commercially. We only ask that you share this material with like minded individuals.

73 and enjoy!

Bill Beech, NJ7P - 12/30/90

Minutes from page 2

NPUB messages. Jim says that NQ1C will talk about that later. Jim says that WA1TPP's MSYS board has a phone line that will allow access to the network at BERK node to anyone that has a password. See the last Quarterly's server section for that number and other info.

N1FCC BELCH

Dave, N1FCC says that the BELCH node is not stable right now but that he will report back. He's currently working on trying to get a TCP link from KA1JY in Connecticut into the BERK repeater via his node. He mentions that he is looking into NOS as an alternate to the MSYS code that he is currently using.

BERK 440 repeater

A discussion about the BERK 440 packet repeater was held with WA2VAM, K1MEA and N1FCC. Dave, N1FCC, mentions that his node shows at the BERK repeater but does not propagate from there into the network as his system is transient right now and his node's NEDAness is in question as well as it is MSYS based. WA2VAM asks "How many nodes are currently being linked to via the 440 repeater". Jim lists off NQ1C-8 (SPRFLD), K1MEA-6 (BBSMTM), N1FCC (BELCH), K1MEA-4 (MTM), WA1TPP (BERK). Jim thinks that the repeater solution is excellent for a user port operation. Jim thinks also that the work that he and WA1TPP are doing with trying to make the servers that are accessing BERK share the channel better is proving to have good results. Jim thinks that it is good that we are learning how to use the repeater as a packet LAN.

Repeater negatives

Kevin, WA2VAM, mentions that he is a little scared that we are using the repeater as a 5 way backbone link where he had enough trouble trying to get a 3 way to carry traffic. Perhaps it is cheep to do the repeater as a backbone but does it give us proportionally cheep or worse results? Kevin is worried that we will depend on the repeater and get in a jam later as more links rely on the repeater. He says that even though it is more expensive to run dedicated point links that perhaps doing so would enhance development and would be worth it in the long run if not in the short run.

Losing 221 band

Jim brings up that the servers are very dependent on the low end of 220, specifically the mess on 221.11. There is some Connecticut on 221.05 as well. Jim is worried that the link that MTM-NCMA-CENTMA has on 223.56 might get crowded out in the near future.

SWNH now 4 ports

Arny, N1BAC, mentions that SWNH is now a 4 port node with a dedicated link to W1FYR BBS called SWNHU and a 440 link down to NCMA node. He says that they are trying to get WA1FHB to move over to SWNHU as well.

N2GTE BBS software

Bob, NQ1C, mentions that N2GTE has a BBS software package that performs remote service requests to other N2GTE PBBSs to try to resolve user forwarding questions, i.e. where is this user?.

BBS "open channel" concept

Dana mentions that Tadd, KA2DEW, has an idea a while back that the PBBSs code authors might want to allow the PBBSs to create "open channels" to neighboring PBBSs so that forwarding could take place immediately instead of once or twice per hour. This might make it unnecessary for PBBSs to do long haul forwarding in the hopes of having the message get there faster than by forwarding it to a neighbor. Participating PBBSs would have guarantees that messages passed by the "open channel" would be delivered as fast as the network could. NQ1C mentions that the N2GTE solution is to resolve "where to forward a user message", not the same as what Dana was talking about.

ALBANY-> SRTOGA gateway

Dana reports that the gateway @ Albany to SRTOGA is on the air so BBS forwarding can now go across that link instead of via WMA220 which is a HTS channel. He mentions that the radio that was supplied by Saratoga RACES for the ALBANY site has a VCO lock problem and although it currently works Dana is in doubt of it's future. He says that to get to the SRTOGA system or points north should connect to ALBNY3 and then SRTOGA. Then connects to BBSUMX may be done. This is the sequence recommended by the Saratoga RACES group. Forwarding north through that system is not being encouraged. What they have working now up to GFL node is doing extremely well and is all high speed stuff. Dana reports that they have learned that the 3 way HTS free link that they have has not adequate and that they will be breaking it up and turning it into point to point double ended link. Dana reports that the SCR system of SRTOGA, GFL and SCR/BBSUMX is doing very well and that as that group is learning and spreading it's technology that they may be adding some nodes. The only thing that they don't have in the system right now is a dedicated user only LAN channel. All of the user ports in their 3 node system are on crowded 2meter channels that have BBS forwarding and other nodes. Anybody experiencing problems with the gateway should send a message to WA2WNI @ WA2PVV as Dana is trying to keep it running at tip top shape. In 6 weeks the gateway hardware is supposed to be upgraded to better stuff.

NESAC committee report:

Dana reports that the committee has be quiet due to their own emergency departments high activity due to repercussions from Desert Shield and Desert Storm.

xxRACE & xxARES

The only thing that NESAC has done this quarter is to put out an advisory about how to connect to the state EOC PBBSs and to send to xxRACE for races messages to xx-state and xxARES for ARES traffic to XX-state. NESAC is encouraging local emergency services bodies to take advantage of packet emergency services.

New redundancy achieved

Jim reports that now that NCMA talks to SWNH on UHF that there exists redundancy between CANDGA and SNH. This assumes the 145.05 hop between WMA and MTM (very crowded) and the 223.56 hop between MTM and NCMA (not too crowded). What we need is another path across southern Vermont to give redundancy that does not depend on the 145.05 hop.

Site Hardening

Dana reports that NESAC is promoting 'site hardening' so that nodes will have battery backup and won't go off the air at the drop of a hat. Cal is providing advice on this subject. Site operators should pay attention to good operating practices and do whatever is

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possible to provide site reliability under emergency conditions.

Lead acid batteries available

Dana announces that he has a source of a trickle supply of nearly new batteries to run sites on backup. Bob, WB2QBQ, has a couple with him that he'll discuss delivery of during one of the breaks. Bob says that he has about $12.50 into each battery and they look to be about 60 amp hour.

The batteries are mostly Panasonic and look to be worth about $200 a piece. These will be made available through WB2QBQ or WA2WNI. A show of hands was looked for to see how many of the batteries would be used by those present. Twenty three batteries were determined to be needed by those present. No action was taken on this.

Voltage drop problem

Jim mentions that when he power failed CHSTR to test the voltages that the TNCs failed he found that the TNCs failed at odd voltages between 11 and 12 volts but that the radios still worked at 10.5 volts. He was thinking about using NICAD cells for backup because NICADs stay at rated voltage until just before failure. Memory problems with NICADs would kill them unless they were deep cycled. Of course murphy would cause the power to die during the deep cycle process. Jim did recommend that the TNCs should be run on a separate battery than the radios because the TNCs fail at the higher voltage.

Someone in the audience suggests that the current conversation has taken a little too long. The chairman closed the emergency services report.

Technical Committee Report

TheNET 2.08 available

Dana and Tadd prepared manuals on the 2.08 product that is based on the work of N700.

GE radios

Dana sold 30 or 40 of the GE radios that are helping to get some nodes on the air and upgrade others. See Dana for info. They were GE Master Exec IIs and were sold for between $30 and $50 for VHF HI and LO band.

Hexipus boards

A few of the Hexipus boards have been sold but there was some delay due to slow ups in delivery of the documentation.

Node naming

One of the things that was supposed to happen between last meeting and now was that Tadd was going to prepare a write up on naming nodes and that nodes in our network were going to be named such that the name was as meaningful in the description of it's location as possible. Tadd is not at the meeting and no document has been presented. Some nodes in the meantime have been renamed. ALBANY, KNOX, AUBRN1, and SYRCUS are good examples.

New nodes on the air

NEWARK node is on the air linked to AUBURN

BRKPRT node is west of Rochester and is on a 3 way with WXFLD and MONROE.

BELNAP is on the air

BUFFLO node is back on the air as a NEDA node.

KNOX now has a 10m port called NYDX10.

Potential nodes and meetings

POTSDM and CANTON nodes are on but are not tied into the rest of the system.

A regional development meeting was held in Scranton Pa [see article in this issue titled "Regional Technical Development Meeting: Scranton Pa]

Nodes, Western NY

A couple of other nodes that are about to come on (some of these have been about to come on for about a year now) ROCH [now on line :ed], ALFRED [now on line] and WARREN, SHERMN, FRKVIL [which are now linked in :ed]

Nodes, Ontario

Eric, VE3NUU, who is from Toronto Canada has been working with many hams in Southern Ontario to create a bunch of NEDA nodes to tie Western NY to Ottawa and Montreal via a path north of Lake Ontario. These would be KINGTN, BELVL, COBURG, PICRNG, TOR???, and Wellum (Font Hill) and that would completely surround the north end of the lake. Part of this would be funded by DxCluster enthusiasts in Toronto. The plan is to link Font Hill to SHERMN via a 4800 baud backbone.

Node, ULSTER + link to ROSE

Dana announces that there may be a new node in Kingston NY called ULSTER that is important to us for two things: First of all it will be another 'home node' and we might get into a discussion on that later and secondly it will provide us with a break out south bound in the vicinity of CLV which was previously unavailable in that region. This site might also be used as a gateway into the ROSE network that is spreading out in New Jersey. Dana says that NX2P wants to set up a ROSE network based on NEDA technical guidelines to demonstrate that ROSE will perform as well as TheNET (if not better) under the same radio - link conditions that NEDA uses for it's backbones.

ALBANY to SRTOGA gateway

Rich says that the ALBANY to SRTOGA is on line now. He brings up the point that there was some misunderstanding between the parties in regards to how the gateway works compared to how the SRTOGA group thought that it would work.

G.A.N.I. Document

WB2JLR thinks the GANI isn't clear enough and might be expanded

NR1N proposed that the GANI should be a source of all of the info that a node op would need to decide about getting involved with NEDA. He said that currently he understood that the GANI was not to be given out blind.

WA2VAM wanted to know why we can't give it blind.

WB2JLR said that it wasn't given blind because it was a short and to the point list of definitions and conditions for a node to be part of the NEDA network. K1MEA agreed and said that it could be given to a non-member if the giver filled in the missing details and was around to answer questions. Dana brings up that it was he that made the motion about how the GANI was to be given out at a previous board meeting. The purpose was that, as Kevin had just said, that it was easy to misconstrue if you were not familiar with the our network how NRS activities should take place and how to gateway The purpose was to have personal contact with someone to explain it so that it would not be misconstrued. There was never any indication that it could not be shared with a non member or with a non-node operator but merely that it shouldn't be given in the blind or just mailed to people so that maybe it could be viewed in the wrong light of perhaps an environment where people do not have the operating methods that we have. Rich read the relevant sections of minutes from various Quarterlies. Rich stated that if anybody wants to promote

NEDA or convince someone to get involved they can photocopy sections of NEDA literature. The GANI doesn't explain many particulars of how the existing methodology is supposed to work. Dana says that he is open to somebody else tackling some of the documentation gap. Rich suggests that since Tadd is the editor that perhaps he would be the person that should receive any improved write ups.

G8BPQ nodes

Rich brings up the question of how G8 nodes should be handled and says that that kind of things should be documented as well. Perhaps the GANI should include information about server ports and connections. Lindsay and Rich talk about proposing a change to the GANI. Jim suggests that interested parties should rewrite the GANI and that throwing things back at Tadd who is currently a student might not be bright or successful. A consensus is arrived at by all of the board members that something needs to be done about it but nobody volunteers. Dana suggests that the next membership package could contain a more severe breakdown of what it is to be part of the NEDA network, to have a gateway etc..

Elmira educational tool

Rich shows the document that was created in the Elmira area as an educational tool.

Questions to go to Dayton

Rich asks if there are any questions to be passed to certain software writers that might show up at Dayton that Rich would corner those people with such questions. If anybody wants Rich to do this they should mail Rich a packet message with those questions before the Dayton hamfest.

WZ2B's Collision Detector

Rich talks about a device that WZ2B invented that counts collisions on a Hexipus.

Tadd's Packet Glossary

Dana shows off the packet glossary that Tadd produced.

KC3BQ technical document

Kevin talks about the technical information that KC3BQ produced for us back in December 89. (KC3BQ is recovering from a major cancer operation).

10 meter gateway and nodename bug

Dana announced that EASTNY 10m gateway at KNDRHK was removed and replaced by NYDX10 at the KNOX site. The new gateway is a Kenwood 440 with a TH6DX beam at 50'. This is far better than the KNDRHK version that was 10 watts into an omni on the ground. Dana says that there is a bug in TN2.08 that wouldn't accept NY10DX as a node name. Dana says that he sent a note about this to Bill, NJ7P asking if this were a feature or bug. Linds thinks that the software may have a check so that it doesn't think that a callsign is a nodename and thus it won't take the number in the middle of the nodename.

KNOX node enhancements

Dana announces that the KNOX matrix was made to be 8 ports with the addition of the NYDX10 node. Apparently a hardware failure coincidentally developed at that time which caused a TNC's RS-232 driver to die. Tadd happened to be there at the time and pulled his mobile TNC and used it to build a matrix coupler wireline so KNOX is now two 5 port nodes.

Dana announces that ALBANY and KNDRHK as well as KNOX are all TN2.08B now. WMA user port is back on the air after a month of downtime.

Hexipus Project Committee report

4 Hexipus boards have been sold. Copies of the WB2JLR HexiPus document were sent out as promotional items. Rich passed around copies. Rich mentions that Tadd's Hexipus document hasn't materialized due to Tadd's school commitments and house fire related problems. Rich relates the information printed in the previous Quarterly's front page article.

Editor's report

Tadd isn't here but Rich comments that he thinks the Winter Quarterly was spectacular (general agreement)

Cal comments on how nice the documents that Dana passed out are.

Maps

W1JFP, Cal, handed out his latest version of maps and asked for corrections after lunch. He also asked for updates from everybody out in the network to send factual and current information whenever anything changes that should be reflected on the maps or whenever any details that are found on the maps that are wrong. Also whenever any nodes are put on the air that are to be temporary or if any nodes that are local slip through the cracks (like BOB DANA etc.) please send Cal an OOPS message so he doesn't go and try to put it on the map and rip out what's left of his hair. This way the maps can be done and done right. He says that when he makes his maps he goes around and asks all of the nodes for an info text and routes and sometimes nodes.

OLD BUSINESS

TCP/IP experimentation

Bob NQ1C relates that testing has not taken place but will any day now as he is working on acquiring the necessary PC for his end. Rich mentioned that Chris, WZ2B (the other end of the TCP test) was off the air due to damage caused by the ice storm and that Chris is looking forward to working with Bob on it.

Dana reported that KB3YV at the Scranton meeting was down on TheNET networking for IP.

Info text

Cal remarks that the info texts are still not even close to being standard. The frequency of a user port should definitely be added to the info texts of all nodes or information as to what dedicated link it is.

Rich mentions that the info text on the Maine .03 nodes is very nice and maybe we should copy from them. Especially considering how easy it is to change info texts with TN2.08B.

Documentation of NEDA administrator's functions

Rich thinks that we need to have a clearer picture of what the rules are for new nodes and servers etc.. This must include who deals with new parties, how the information about the intent of a new node or server is.

Dana brings up that he requested that documents be created, way back at the spring '90 meeting, that describe what each and every appointed and voted position is, does and means. We are a big enough club now that we are going to need this in order to have the club function in a way that is socially acceptable. Dana tosses up a proposal that somebody who is currently not active in club administration should come forward and work on this kind of documentation. This would help in the inconsistent responses that the current administration staff tend to

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see and to make. This is a real problem. Dana mentions two symptoms of this problem. Dana makes allusions to a recent encounter between Linds, NR1N, as NRS, and Tadd, KA2DEW as node op of SNH. Dana thinks that we should leave this meeting with some kind of solution to these kinds of problems.

Tadd and Linds

K1MEA reviewed the problem: Linds was working with KB4N to compromise with KB4N. KB4N wanted to carry the NEDA nodes list. The NEDA policy, which is poorly documented, states that this is bad. Linds was working with KB4N to make his station more like a NEDA node so that the questionable 'bad' was fixed. Jim, K1MEA noted errors occurring in the NBOD/NTECH distribution lists where he knew that messages were getting sent that weren't getting received. Linds must have missed a message that WB2JLR sent via NTECH stating the Technical Committee Chairman's position. Jim also believes that neither he, nor anybody else, in our organization understands the G8BPQ code's emulation of TheNET. Jim thinks that Tadd acted wrongly in taking action and that a phone call to Linds would have been in order.

Linds spoke up and said that the problem was that the situation kept changing. 1> He [KB4N] was not a NEDA node 2> He is capable of doing level 3 across the network. 3> The solution that NR1N was working towards was based on a technical fix to the problem. The problem seems to be that many NEDA officers and appointees are against the concept of using G8BPQ in the network.

Further discussion occurred which included a request for somebody to create a statement of what the NRS, node owner, tech committee chairman and board member should have as roles and responsibilities.

Rich restates the issues: There is a technical issue about whether outside nodes should be allowed to lock in nodes outside our system. Enforcement, implementation and documentation of that needs work. The other issue is whether an NRS or tech committee chairman may reconfigure a node in someone else's territory.

Jim restates that he wishes for documentation describing what each person is responsible for. NRS coverage area must be defined, Jim says. Linds asks how policy decisions may be made by tech committee members and board members. Jim says that he doesn't think that the node owner can do whatever he wants against the wishes of the board. Dana said the node owner can pull the plug on his equipment if he doesn't get satisfaction from NEDA, the network, or the NEDA technical committee.

Bob, NQ1C, doesn't think that all node owners would have the technical expertise to judge the tech committee. But even so they still have the ultimate veto power.

Kevin says that as the network evolves some people will pull out because they don't like the way things have changes or their own position in the network. The club is stuck with a kind of inertia trying to keep the largest network possible because we can't please everybody. Bob, WB2QBQ mentions that the club was started by a bunch of guys who 'knew a better way' but that we have to watch the interpersonal relationships.

Rich states that the division of the network by region is good and that the NRS for the region must be left to perform his work in that region.

What's wrong with non-NEDA node op locking in our nodes?

Herb, WB1DSW, says that somewhere we should define what's wrong with doing level 3 directly into the network from outside by locking in nodes. Rich says that the main problem is that we don't know how L3/L4 works as well as we must before we change the existing policy. We don't know as much about G8BPQ and MSYS as we do about TheNET. Our NRSs still don't have the capability of monitoring traffic on the backbone sufficiently to determine abuse. The method that the club has defined with each station connecting into the network, then across, then out, keeps us safe. Users and servers should uplink to the local node, then jump across the network or to the destination node.

Herb asks if our policy is that all network users, including servers, are supposed to connect to the local node first, then across. Rich answered yes.

Herb asks that **if** he documents another node package sufficiently that the NEDA NRS can understand, interrogate and prove compatible operation, **then** will this new node package be acceptable to become a real active part of the network? Jim K1MEA says that NEDA says no node may be part of the network if NEDA doesn't have control. He also listed off a few instabilities in the G8BPQ software that make it a very bad choice at this time.

Rich asks why a user of a non-TheNET node software package couldn't come in via a local port as per NEDA recommendations? Herb says that there is no problem and it only takes one line in the forward file. Jim says that the control that NEDA is defining is for the betterment of the use of the frequencies that we are using and the network. NEDA has something that we know to work. It is not political. Our public relations isn't as good as it needs to be. A lot of our technology is based on trial and error. We also need some computer simulation efforts to see if we can improve things. Rich says that as time goes on we will continue to learn.

Cal makes a motion that NEDA establish a policy that L3/L4 connects to inside the network from a non-NEDA controlled node are not allowed. Cal asks that all stations that have the capability of doing L3/L4 across the network and are currently doing so be asked to stop.

Dana brings up that a TCP station that uses the network would have to be part of the network organization and controlled by a person participating in the technical committee.

Dana seconds the motion.

Jim asks if the problem is defined correctly.

Cal says that the only way to limit L3/L4 abuse is by mutual agreement of all parties or by massive sysopping of the network. Dana brings up that there may be a solution by modifying TheNET to eliminate slime trailing.

Cal, W1JFP, doesn't think there's any reason why we can't tell the individuals that are violating the ingress rule to stop. Cal thinks that stating that we don't know if it's bad isn't a problem but that we have to stick to our guns. Bob, NQ1C agrees and that we should specify non-NEDA node in the policy and not mention TheNET.

Dana brings up that the L3/L4 problem also includes the fact that we propagate BBSxxx G8BPQ node names in the local regions around those boards. Kevin states that Rob, KC3BQ, mentioned that problem in his notes back in '89. Dana mentions

that there would be 'hell to pay' if we made a policy to turn off that propagation. Jim says that he likes the feature of having BBSMTM show at the MTM node. He says that this way his users connect to MTM and connect to BBSMTM thinking that they are going direct over 145.05 when in fact they are going by way of 440 through the BERK node.

Dana asks if a BPQ BBS users who are doing inbound via the BBSxxx should be using NEDA specified parms.

Linds makes an example of the change that would be required to make this policy. He says that currently a user from his area can do C CENTNH, C BBSWOK. After this policy is in effect the user would have to do C CENTNH, C NHOEM, C BBSWOK. Cal, W1JFP, says that this is an excellent point and withdraws his motion.

Russ, WA1TLN, asks Rich how bad the interference with the network from a single BPQ node is.

Jim suggests that the L3/L4 problem should be ignored unless it is abused by taking greater than fair share of network band width. No blocks would be inserted in the network unless there was a cooperation problem between the NRS and the L3/L4 external user. Cal brings up that the NRS is the pivotal person. Dana brings up that only Dana and WA1TPP are capable of observing the problem on their matrix monitors.

Rich says that our nodes don't do nodes broadcasts so that stations would have to do L2 connects into the network. Rich thinks that we should go with W1JFP's proposal that we don't allow ingress into the network at level 3. Then we decide how to handle the justifications for that and how to handle the BBSxxx detail at another time. Dana agrees and mentions that the BBSxxx problem's are localized by design. They only show in the local region around the PBBSs.

Rich restates the proposal that NEDA does not allow L3/L4 connections from outside the network. Dana declares this out of order due to the fact that it is presented in the negative. Bob, NQ1C, restates that L3/L4 capable sources must come into the network by connection to the local NEDA control port and then launching into the network.

Linds brings up that the NRS is the person who checks out that a new node is correctly set up before it is admitted to the network. NTECH does not need to be involved. If the NRS does not think that the node meets the requirements then the NRS should cause the node to be gatewayed to.

L3/L4 connects across the NEDA network must originate from NEDA approved sources. WA2WNI seconded the motion. Passed.

At this time the meeting recessed for lunch at 1:12PM.

The meeting was reconvened at 1:50PM.

Rich brought up that sources wanting to connect across the NEDA network must connect to the adjacent NEDA node first. If a NRS notices that this is going on in another NRS's territory he should contact the NRS local to the problem. If a NRS notices that this is going on in his own area he should contact the person that is making the violation. Blocks would only be done after the person doesn't disable locked nodes that point inside the network.

Lindsay returns

After the assurance from all present that spoke to Tadd that Tadd is sorry that he meddled with Lindsay's work, Lindsay withdrew his resignation.

L3/L4 from outside the network, to inside

Cal discussed how the PBBSs who are running G8BPQ were to be informed of the L3/L4 into the network violation now that this motion has been passed. Cal says he is trying to word it more general than just for G8BPQ and PBBSs. Rich suggests that he will take care of writing such a statement and distributing it. Jim suggests that announcing that our network may be sabotaged by a G8 user might cause somebody to do this. Jim mentions that anti-NEDA hate mail is carried very efficiently by the NEDA network (laughs).

Cal, who has been making notes, states "Resolved that all outside sources be required to first connect to the adjacent NEDA node before connecting on in the network. This action is necessary to insure that the network resources are equally shared." K1MEA seconds: passed.

DxCluster user abuse

Dana says that the installation of extra DxCluster systems accessible from the network has eliminate the previously observed abuses. Users no longer feel the need to connect the length of the network to obtain Dx spotting information.

Rich mentions that he read that the G8BPQ code supports DxCluster now. Cal recommends that this not be recommended as the problems we're already having with PBBSs using G8 are bad enough.

BBSxxx nodes propagation

Kevin makes a motion that we not allow any more G8BPQ/MSYS etc.. BBSs to propagate even in the local region, outside its local node cluster until the problems associated with this are resolved. WB2JLR seconds. Passed.

Chairman of board meetings

Rich brings up the agenda item that there might want to be a constant board meeting chairman. Dana reminds us that at one time this was discussed and that the previous board meeting chairman would serve until the next board meeting. Cal, W1JFP, reads "It would appear that it would be appropriate to have a permanent board chairman to act on matters that required coordination between meetings. The selected leader could chair the meetings but need not necessarily do so if the group prefers otherwise. Most organizations have a person at the head. This head would be chosen by the board members as opposed to the more formal arrangement of voting in the position at the annual meeting"

Dana nominates Cal, W1JFP, for that position. Rich seconds. passed.

Cal moves that Rich Place, WB2JLR, is nominated for vice chairman. Dana seconds. Passed.

Location for next meeting

Rich mentions that Don Russ, N2CZL, has suggested Oneonta as a good place for one and has volunteered a location. The date was presented as July 27th. Cal made this a motion. Rich seconds: passed.

Second Class Mailing Permit

Herb Salls, WB1DSW, reviewed the questions of "what is a second class permit?", "what does it take to get one?", "what does it do for us?", "what does this do to advertising?", "How slow will the mail be?" etc... It was decided that there would be a one or two day delay maximum between the service that we have been getting and the 2nd class permit. We can classify for 2nd class as a non-profit organiza-

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tion. There will be an overwhelming savings in our mail costs. The last Quarterly mailing of 250 booklets was $302.50. That's about $1.21/piece. If you mail second class, there is a $275 one time fee. If we divided that over 4 quarters and at 14.2 cents/pound (x250 = $9.18) for a total of $77.93 to mail out 250 Quarterlies.

At this time the fire alarms went wild for several minutes and rendered all present deaf. Firemen ran through the room. Mayhem commenced. It was pretty bad.

Herb says "Thank you Mr. Bell. Much appreciate that"

So it is much cheaper. It would also be much easier to mail it. No more licking of stamps as we could use a rubber stamp to print our second class mail permit number on the envelope. [Amid the noise of fire trucks leaving] There is a sorting requirement but with the computer this is pretty trivial. Herb says that he has to mail the Quarterlies from East Kingston to meet the requirements of a 'known office of publication' which should be at Herb's house for convenience. Otherwise we'd have to rent an office or something. This is where an annual audit is performed. Herb can only drop off the Quarterlies on Saturday as the East Kingston post office closes on weekdays before he gets home. The 'known office of publication' is transferable for a fee. We also should put money on deposit so we can use the permit number. Herb recommends $100.

Dana asks what the nature of the audit is. Herb says that the postal official would look at the mailing list and paper documentation that we have to back up the computer mailing list. The postal official would make sure that the newsletter is what we are billing it as and that there isn't more advertising in the newsletter than we are saying there is. Dana and Herb discussed the funds that we'd have to spend to mail a newsletter that does have advertising. The amount appears to be trivial and we could definitely afford to do advertising.

NQ1C remarks that the permit number can also be used for first class for convenience. Herb, WB1DSW, says that he hasn't heard this be he'll find out.

Cal, W1JFP, asks if Herb minds the inconvenience of having the audit done. Herb says that he'll work the timing out with the Manchester post office. Cal, WA1WOK, remarks that he can get 1 or 2 volunteers to help Herb with mailing.

NQ1C mentions that the delays that HCRA has with mailing is higher for local mailing.

[fire trucks return]

Herb also requests that NEDA invest in the Domestic Mail Manual @ $24.95 from the Government Printing Office. Also he wants to purchase a $15 rubber stamp with our second class permit on it.

Dana Jonas, WA2WNI makes a motion that we authorize Herb Salls up to $390 to get the second class mailing permit started. Cal, W1JFP, seconds it. Passed. Herb says that he'll have it in the mail on Monday.

Frequency Coordination

Skipped over

NEDA Official Bulletin format

Dana says that he hasn't worked this up yet and it should be skipped. Jim K1MEA, brings up that it is difficult to determine from NTECH/NBOD mail what is discussion and what is official ruling. When a ruling is determined it should be logged somewhere as well, Jim adds. This is postponed to the next meeting.

WB6RDH Bulletin board funding

NQ1C talks about this mentioning that he's gotten lots of good stuff that has benefited NEDA and the BBS ops.

Rich, WB2JLR says that if NEDA supports WB6RDH's board then wouldn't other people wonder why NEDA doesn't support them.

Dana recommends that editor puts something in the next Quarterly giving information on the WB6RDH board and suggesting that NEDA likes the activities of this board and that individuals could support it. NQ1C should write this article and send it to Tadd to be included in the Quarterly.

Club membership

Is it reasonable to have a club affiliation membership?

Herb, WB1DSW, stated that NEPRA has joined as an affiliated club at the $100 rate but it appears that there are other clubs that join at the $15 and $25 rate. Why is this?

Cal makes a motion that the $100 membership is discontinued and that the difference between that membership and the $25 voting membership be refunded to any clubs that have joined at that rate. K1MEA seconds it.

Dana reads from the January 1990 board meeting minutes. Dana states that the Affiliated club gets copies of the new documentation as soon as it is produced and they get space in the Quarterly and in the Annual for every issue Herb, WB1DSW, asks if Joe Schmoe's Dx Society wouldn't get the same service if they sent an ad. Dana states that the editor might not print it or could edit it down. Herb doesn't see $75 difference. Jim is against this concept because it is insulting to ask a club that has already put $1000s of dollars into the network to join NEDA at $100.

Someone asks if NEPRA's advertisement in the Quarterly would violate the second class permit agreement that we want. Herb says no as NEPRA's add isn't for profit either.

Dana asks if a club that joins with a $25 membership level can re-assign the person that attends meetings. This was a benefit of the club affiliation membership.

Rich amends the motion to state that instead of eliminating the club membership it would be reduced in cost to $25. : passed.

Linds asks what happens with the $75. Cal and Rich believe that the money should be refunded.

Jim brings up that people who are members of a club that is affiliated with NEDA might think that they shouldn't join NEDA as well. Herb says that this was a reason for the high $100 fee in the first place. Cal thinks that the fact that they get their very own Quarterly should be enough.

Constitution Revision

Should the Constitution be revised to provide for written ballet by mail to elect board members with the result being announced at the general meeting. This would provide for the general meeting being strictly show and tell.

Jim says that "Tadd felt that he'd like to see the general meeting should become basically a show and tell." It seems to me that we'd get greater participation with mailed ballets. Rich says that a lot of people can't make it to the general meeting. Linds asks if the timing is correct so that the ballet can be included in the Fall Quarterly. This would send ballets to everybody, voting or non-voting but only eligible to voting members. [The written submission of this is printed elsewhere in this issue]

Resource Manual, funds for

Dana shows the NEDA Resource manual which he says was created in a hurry. The document was made for promotion for NEDA, Dana says. He wants to do another printing of the book which is running out pretty quick. Dana points out that we've already gotten several new

memberships because of the manual. We probably turn a profit on it and it also prompts potential node ops. Herb, WB1DSW, agrees that we get a flurry of new members when we create new documents and distribute them. Dana presents a $102 bill for 100 copies of the manual. Dana moves that the bill is paid for this. Dana also would like to make 200 more copies after some subtle revisions are made. The printer would bill the treasurer after the 200 copies were done. Dana would like reimbursement for the $102 immediately. The question as to whether funds should be charged for the document was raised and after discussion decided against. Jim brings up that documentation is what we give the members for their money so let's make it free.

Linds suggests that this might be a document that could be given in place of the GANI to a non-informed person asking about node implementation.

Dana says that the resource manual was a highly edited version of the original document by NJ7P. Tadd and Dana wrote about half of the information in the manual. The information in the manual is based on NEDA design philosophy. Dana proposes that maybe the information might be incorporated into the Annual Membership Package. Dana suggests that we might want to ship the manual with a floppy disk.

Jim asks if TN2.08B is the software of choice. Dana says yes because of the Heard list, better routing table list, better controllability of ports, including the ability to stop propagation of nodes through any node using the R 2 and R 3 commands. This may also be used to selectively stop use of the system by abusers. Jim brings up that TN2.08 has been used badly elsewhere because of this feature.

Dana also asks for funds to purchase floppy disks. He estimates $28 to purchase 100 floppies.

Cal suggests that $228 be allocated to purchase the previously described materials. Dana says it would take $300. Cal restates that $328 should be allocated.

The subject is changed briefly to talk about other documentation requirements against the current low value of the treasury. Hexipus documentation is briefly discussed. Rich says that the Hexipus documentation is written but not published.

Dana moves that $102 be appropriated to refund his purchase of 100 blue resource manuals. Seconded: passed

Dana asks if a better deal exists for the 5 1/4" floppies. Rich asks how many of the first 100 books are left. Dana guesses 35. Rich suggests that maybe if we made 200 more that 2.09 might come out before we get rid of 200. Dana suggests that they can be gotten rid of very easily at Dayton, Rochester and Deerfield. Dana points out that the back page has a membership application. Linds recommends that at $1 per piece that they should be reserved for technical development sessions. Dana says that what Tadd, he and Bob WB2QBQ, have been doing is running to hamfests and making personal contact with people who are highly motivated to do networking in packet radio and then to entice those specific people to get them going by giving them documentation and software. Dana suggests that also Quarterlies might also be required. Herb, WB1DSW, mentions that he has some extra Quarterlies as well so Quarterlies won't be required.

Kevin, WA2VAM, brings up that the document says NEDA on it but he wants to know who approved it. Kevin speaks strongly against individuals producing documents or products in NEDA's name or expecting NEDA funding without prior board of directors authorization. Kevin wants a motion made such that the board of directors has more of a control of the content of documents that have the NEDA name on them. Kevin says that as a board member he will vote against funding any item or documentation that was created without prior board of directors authorization.

Jim calls a point of order to bring us back to Dana's motion about funding for more Resource Manuals. The question is how much money should Dana spend on disks. Fred, N1EZD, says that he'll donate 50 floppies. (claps)

Kevin suggests for a motion that further publications or projects must have prior approval. Kevin brings up that the resource manual has not been seen before by the chairman of the technical committee.

Kevin moves that all publications or projects or information dispersal that is intended to be represented as NEDA material needs prior approval before they can be produced. Linds seconds: passed.

Quarterly Newsletter

Dana moves that we allocate $100 to spend on mailing expense for the coming Quarterly. Rich seconds: passed

Last quarter printing we had 500+ Quarterlies made for $335.

** At this time Jim, K1MEA and Bob, NQ1C leave **

There is still a quorum with WA2VAM, WA2WNI, WB2JLR, NR1N, W1JFP.

Conversation occurs about the large number of Quarterlies that were printed. The consensus is that it is to our advantage to have extras printed. Lindsay says that we are spending $600 per year for extra Quarterlies. Herb says that we can't accurately predict how many Quarterlies we are going to need. Our printer would feel abused if we keep going back for more copies. Cal makes a motion that we appropriate the sum of $335 to print Quarterlies for the Spring quarter. Dana seconds: passed.

Cal states that we have $782 in the treasury at that point.

Purchasing of Modems for research

Consensus is that there should be no investment in modem hardware at this time.

Freebees, funding for

Dana brings up that the current freebee is as much better than the previous freebee as our current Quarterly is over the Quarterly of a few quarters ago.

Herb mentions that the previous freebee cost $63 for 300 of them at a quickie print shop. Rich, WB2JLR, makes a motion that we authorize $100 to print freebees and that the board of directors will have to approve it first. WA2WNI seconded: passed

Funding for promotional events

Rich wants to know if anybody has a specific need for funding for a flea market table. Rochester is free. Dana suggests that last year we had funding available and that it was nice to have it around even though nobody drew on it. The item was dropped.

Funding for Hexipus Advertising

Cal says that somebody was going to do a magazine advertisement. Rich says that we would have a magazine review that wouldn't cost us.

Resource Manuals, funding for

Dana makes a motion that pending approval of the board for the document that we allocated up to $200 for production of the technical resource documentation. Rich states that the Quarterly might be a good enough handout that the Resource Manual and the disk might be unnecessary. Linds states that the only person who would need the Resource Manual would be someone who had $3000 to spend on a node. Rich suggests that we amend the motion to be $100.

Continued on page 35

SERVERs Accessible From The NEDA Network

The following is a list of PBBS's that can be reached from the NEDA network. The list was compiled from forwarding files that were submitted to me through 26 Jan 91. Some paths have nodes that are not part of the NEDA network. I have tried to provide the best path from inside the NEDA system. Please consult the "BBS Operation" section in the membership package for information on interpreting this table. Some of the paths list here may be a little rough. Some of the paths have been replaced by better ones since this list was compiled. Please keep in mind that in packet radio, change is the rule (much like other branches of amateur radio).

Note: Do NOT forward 3rd party traffic long haul. It might be nice to send traffic that is destined for a PBBS direct to that PBBS but there is no reason to do long haul forwarding of bulletins and traffic that you can't route to it's final destination!

The first nodename in each connect path is a NEDA network port that is propagated. Other nodenames may be PBBS, non NEDA nodes or local ports on NEDA nodes.

Class 1: wireline from NEDA node
Class 2: direct from 220 or 440 NEDA port
Class 3: multi hop from NEDA node via non 2meter links
Class 4: direct connect from 2m or HF NEDA user port.
Class 5: digipeater or multi-hop over 2m or HF from a NEDA user port.

—Jim, K1MEA
BBS Committee Chairman

PBBS servers

call	path	Class	Member?	NODE cmptbl?	notes
k1acl	kng111,k1acl	2	n	n	rochester nh
n1api	chstr,berk,connct,n1dcs-2,n1api-4	3	n	n	meriden ct
kc2az	elmira,bbsaz,kc2az	5	n	y	elmira ny
n1bgg	kng111,mbos,c 3 n1bgg	3	n	y	charlestown ma
k1cf	nshr22 k1cf	2	n		chelsea ma
wb2coy	clv440,bbscoy	2	y	y	poughkeepsie ny
n1dcs	chstr,berk,connct,n1dcs-2,n1dcs-4	3	n	n	new haven conn
wb1dsw	kng111,bbsdsw	1	y	y	goffstown nh
w1eoo	chstr,berk,connct,icrc07,w1eoo-1	5	n	n	winstead ct
wa1fhb	swnh,wa1fhb	5	n	n	marlow nh
w1fyr	swnhu,w1fyr-1 (aplink + BBS)	2	y	n	gilsum nh
ka1goz	snh,bbsgoz	2	y	y	nashua nh
wa1iie	kng111,mbos,lew,wa1iie	5	n	n	vassailboro me
kq1k	kng111,mbos,scit,kq1k	3	n	n	dennis ma
k1mea	chstr,k1mea-4	2	y	y	easthampton ma
ka1mgo	snh,bbsmgo	5	n	y	methuen ma
ns1n	kng111,mbos,scit,ns1n	3	y	y	scituate ma
kb4n	snhuhf,bbsash	2	n	y	nashua nh
w1ny	spfld,bbswma	1	y	y	springfield ma
w1ops	chstr,berk,connct,ka1jes-12,w1ops-13,w1ops-1	5	n	n	waterford ct
ka1pep	nshr22,ka1pep	2	n	y	lawrence ma
wa1phy	kng111,mbos,bbsphy	3	y	y	mitre arc bedford ma
kb1pj	snhuhf,kb1pj (aplink)	5	y	n	amherst nh
wa2pvv	knd220,Net40	2	y	y	valatie ny
wb2qja	chstr,berk,connct,wb2zii-9,wb2qja-4	5	n	n	white plains ny
ka1rci	kng111,mbos,pvd,ka1rci	3	n	n	lincoln ri
w2rgi	stmfrd,w2rgi (chk w/sysop for fwd window)	4	n	n	oneota ny
wa2rkn	wma220,eny2,wa2rkn-2	5	n	y	poughkeepsie ny
k3rli	elmira,bbsaz,elm220,k3rli v k3rli-2	3	n	n	wilkes-barre pa
k1rqg	kng111,mbos,mwu,k1rqg-1,k1rqg	3	n	n	bucksport me
wa2sna	berk,connct,kg1o-9,nnj3,wa2sna-1	5	n	n	hawthorn nj
ka1srd	snh,bbssrd	4	n	y	fitchburg ma
wa2tve	utica,wa2tve-4	2	y	y	utica ny
k1ugm	kng111,bbsugm	2	y	n	wakefield ma
wa2umx	albny3,srtoga,wa2umx	2	y	n	saratoga ny
k1uol	clv,k1uol	4	n	n	bethel ct
wa1wok	nhoem1,bbswok	1	y	y	nhocm concord nh
wb2wxq	candga,candga2,wa2wxq	2	n	n	rochester ny

DOSGate

call	path	Class	Member?	NODE cmptbl?	notes
nm1d	snh,nm1d-2 (dosgate /r callbook)	4	n	n	derry nh
wb4hfn	mtunc,wb4hfn	2	n	n	?

Continued on next page

DxClusters

call	path	Class	Member?	NODE cmptbl?	notes
k1ea	ycccdx,k1ea	2	n	n	harvard ma
k2tr	dxknox,k2tr	2	y	n	knox county ny (albany)
wa2tve	dxclus,wa2tve-2	2	y	n	utica ny
w2hpf	monroe,rdxa,w2hjf	2	y	n	rochester ny

Other

call	path	Class	Member?	NODE cmptbl?	notes
wd1v	nhoem1,nhnet,wd1v (CD ROM callbook)	5	n	n	manchester.nh
k1bpm	nshr22,k1bpm	2	n	y	peabody ma

<< Please report any bad information or changes to NEDA @ W1NY. Title >>
<< it "Attn.: BBS Committee". Otherwise it'll still be bad in the next issue! >>
<< A current machine readable version of this table is available for download >>
<< from the K1MEA BBS under the file section NEDA. >>

Minutes from page 33

Lindsay submits that the few copies that we have left should be enough to give to existing sysops. Dana brings up the concept of selling it again. Kevin says that if they want it bad enough to pay for the mailing of it then we should give it to them. Herb guesses that it will cost us 65 cents to mail it. Dana suggests include a disk and sell it for $3 including mailing. Cal says that it would save a lot of hassle if we just swallowed the expense and gave it out for nothing if we were discriminate. Linds and Rich decide that the fewer copies that we have the more discriminate we will be. Rich says that we won't have another 200 new NEDA nodes in some unmentioned period of time.

Dana thinks that we are pinching pennies. He is looking for $200 still. The board of directors will still have approval at any time to spend from that kitty. Kevin seconds: passed with 3 for, Cal abstained and Kevin against.

STMFRD upgrade

Kevin and Jim want to acquire funds from private individuals and clubs to fund a speed improvement for the STMFRD-> CHSTR link.

Dana brings up the Tadd pipedream of a 56KB network. [Lots of interesting pipe whistles in the background]. Kevin seems taken aback. Cal comments that if this project is far enough forward to supplant proven technology (9600 baud) that he would like to have been informed earlier. Dana says that it isn't past the madscheme stage.

Someone in the audience suggests that the agenda for future meetings be ordered so that appropriations are at the top of New Business and Old Business. Cal and Dana agree.

Kevin, WA2VAM leaves.
W1JFP, WA2WNI, NR1N, WB2JLR remain so Quorum still exists

Canadian Membership

Herb, WB1DSW says that Canadian checks cost $5 per check to deposit so Canadian members must add $5 American to their membership which must already be in American funds. Cal suggests that we might want to get a Canadian POBox such that Canadian funds may be filtered to reduce the number of funds transfer.

Dana makes a motion that an additional $5 (American) assessment be made for all Canadian checks: WB2JLR seconded: passed

Board Member Alternates

Dana asks that Bob, WB2QBQ be appointed his alternate. Bob is node owner/operator of KNOX node and part owner of CHERRY. Passed

General Meeting

Rich asks if anybody has objection to holding the general meeting the same weekend as the fall quarterly board meeting. Linds suggests that we might want to have 3 or 4 simultaneous regional meetings instead. Tabled Cal asks if we want to delete the requirement for the annual meeting. Linds says yes. Cal suggests that we delete the requirement for the annual meeting. Copies of Cal's recommendation and hand written 6 times.

Hexipus Consignments

Cal provides a sample consignment document. The document has instructions which describes its purpose. [See reduced copy elsewhere in this Quarterly] Dana suggests that we can't do this business over packet. Cal says he'll revise the document to delete the comments about doing it over amateur radio. Phone or US mail will be used. Dana thinks it's really good. Linds moves that we approve it. Rich seconds. Approved. Cal says he'll ship it to Howie. Dana says he'll make his own copies.

Chairman of next board meeting

Lindsay suggests that Cal should be the default meeting chairman unless it is brought up otherwise at another time. Cal says that he'll continue to do the agenda.

220 band and coordination

Dana mentions that the Upper New York REPeater COuncil was discussing 220 at it's last meeting. He asks what critical links NEDA has below 222Mhz. Linds mentions VNH-CENTNH-SWNH on 220.55. Dana says that links in Eastern NY that are below 222 are moving to low power 440 links. Dana tells us that in Eastern NY approval has been granted by UNYRepCo to allow 440 splinter frequencies (12.5Khz frequencies) to be used for low power point to point links running less than 5 watts and directional antennas with 3Khz or less deviation. Dana recommends that Linds suggest to NESMC that they allow this as well. UNYRepCo also approved new 2m frequencies for packet usage. This specifies low power 10 watt ERP, non-elevated locations on 147.42 435, 45, 465 and 48. This allows packet channels to be added to sites that already have packet sites on the low end of the 2m band. This allows for true cellularization of packet LANs.

6 meters + NH nodes

Dana brings up that WB2QBQ and he are looking into putting up a link between NH and NY through lower Vermont. 6 meters is being considered.

Cal brings up that every location in his area seems to be full. Cal says that he can't accommodate another port at SWNH or VNH.

Rich makes a motion that we adjourn the meeting. Cal seconds: meeting closed at 4:51PM.

—WA2WNI
—NEDA Secratary

Membership Roster as of 6/10/91 - 244 members

callsign	*last name*	*first*	*city*	*state*	*home BBS*	*exp mem*
VE3ABG	Caberlin	Joe	Willowdale	ON	VE3OY	9205 Q
K2AE	Schenectady ARA		Scotia	NY	WA2UMX	9201 V
WB1AEK	Bullett	Charles	Auburn	ME	WA1OJB	9106 Q
N2AFP	Cannan	Frank	Livermore	NY	-	9108 V
N1AIU	Dawson	Earl	Enfield	CT	K1MEA	9203 Q
K2APL	Buckwalter	Stan	Briarwood	NY	K2APL	9205 Q
N1AQF	Sullivan	Jim	Woburn	MA	-	9107 Q
VE2AQI	Leslie	Jim	DDO	QU	VE2FKB	9203 Q
WZ2B	Piggot	Charles	Medford	NY	WB2WXQ	9202 V
N1BAC	Johnson	Arnold	N. Swanzey	NH	W1FYR	9105 S
N2BEB	King	Jay	Rochester	NY	WB2PSI	9205 Q
K2BEH	Wenskus	James	Rochester	NY	WB2WXQ	9105 Q
VE2BMQ	Lang	Burt		QU	VE2FKB	9112 Q
N1BTQ	Smith	Tim	Mattapoisett	MA	WA1PHY	9110 Q
N2BUL	Altpeter	Paul	Victor	NY	-	9201 Q
K1BYV	Sadowski	Edward	Coventry	RI	KA1RCI	9203 Q
NQ1C	Lafleur	Bob	Springfield	MA	W1NY	9111 V
N1CBA	Peterson	John	Augusta	ME	-	9110 Q
VE3CDX	Garratt	Barry	Ontario	CD	-	9201 V
WA2CEB	Griffin	Dennis	Orchard Park	NY	W2OY	9111 V
N2CJ	Stampf	Charles	Lagrangville	NY	WB2COY	9204 V
N1CJD	Cui	Dan	Barrington	NH	WB1DSW	9112 Q
WB2COY	Farrell	Robert	Poughkeepsie	NY	WB2COY	9204 Q
N1CR	Barry	Bob	Nashua	NH	KB4N	9205 S
KB2CS	Abel	Jack	Albany	NY	KB2CS	9203 Q
WB3CUF	Farr	Well	Cntrl Bridge	NY	WA2WNI	9105 V
K1CXS	Henderson	Leon	Wht Riv Jct	VT	-	9105 Q
N2CZL	Russ	Donald	Bainbridge	NY	W2RGI	9203 V
W1DA	Hitz	George	Sudbury	MA	K1UGM	9201 V
N2DAY	Baker	Raymond	Depew	NY	W2OY	9110 Q
N1DCO	Clark	Donald	W. Newbury	VT	W1FYR	9105 Q
N3DDY	Timmins	William	Warren	PA	-	9111 Q
KA2DEW	Torborg	Tadd	Potsdam	NY	KA2JXI	9510 V
KD2DL	Baker	Brian	Depew	NY	N2CVQ	9110 Q
N2DMP	Walter	Ronald	Liverpool	NY	CNYBBS	9105 S
WA1DPP	Howarth	Robert	Lisbon	NH	WA1DPP	9111 Q
N1DQQ	Donah	Dennis	Hudson	NH	WB1DSW	9106 Q
N2DS	Schmarder	David	Beaver Dams	NY	KC2AZ	9203 V
KA2DST	Clark	Jim	N.Plainfield	NJ	KB4CYC	9110 V
WB1DSW	New Englnd Packet RA		Needham	MA	WB1DSW	9203 V
WB1DSW	Salls	Herb	E. Kingston	NH	WB1DSW	9111 V
N2DU	Unverhau	David	Schenectady	NY	WA2UMX	9209 V
N5DUB	Everitt	Doug	Boulder	CO	-	9204 Q
W2DUC	Cupp	Fred	Fairport	NY	WB2WXQ	9206 Q
N4DW	Wilson	Dave	E. Burke	VT	N4DW	9204 Q
WB2DWD	Seastream	Robert	Long Valley	NJ	N2ELC	9112 Q
NR2E	Stull	Harold	Corning	NY	KC2AZ	9204 Q
K1EA	Wollf	Ken	Harvard	MA	-	9105 V
VE3EBT	Tilley	David	Lancaster	ON	-	9401 Q
VE3EJ	Sluymer	John	Grassie	ON	-	9201 Q
WA2ENW	Elliott	Edward	Shortsville	NY	-	9201 Q
N3ET	Lilly	Randy	Allentown	PA	N3ET	9107 Q
N2EUW	Clark	Albert	Phoenix	NY	-	9202 Q
N1EZD	Donaldson	Fred	Templeton	MA	N1EZD	9204 V
NZ1F	Lundholm	Don	Durham	NH	WB1DSW	9107 S
KY2F	Swiatlowski	Fred	Oswego	NY	-	9205 Q
W2FAM	Ward	James	Nichols	NY	WF2A	9205 Q
WA1FBI	Bassett	Doug	Greenfield	MA	K1MEA	9112 Q
N1FCC	Taylor	Dave	Belchertown	MA	W1NY	9111 V

callsign	*last name*	*first*	*city*	*state*	*home BBS*	*exp mem*
W1FEW	Brown	Richard	Windham	NH	KB4N	9203 S
N1FGY	Grosso	Ed	New Ashford	MA	WA2UMX	9112 Q
N1FIL	St Jean	Richard	Manchester	NH	WA1WOK	9105 Q
N2FQA	Pease	Dudley	Rochester	NY	-	9205 Q
WA2FQA	Friedman	Jerrold	Spencer	NY	WF2A	9111 Q
N1FWR	Barry	Chris	Chicopee	MA	K1MEA	9204 S
W1FYR	Merril	Alan	Gilsum	NH	W1FYR	9105 V
KC1FZ	Davis	George	Hingham	MA	NS1N	9112 Q
KB2FZQ	Koopman	William	Glens Falls	NY	WA2UMX	9107 S
NM1G	Rudenauer	F. X.	Acton	MA	-	9106 Q
NM3G	Leuthold	Brian	Waterford	PA	NM3G	9111 Q
N1GBE	Celone	Ralph	Thomaston	CT	N1DCS	9203 Q
N2GDE	Hansen	Bob	Elmira	NY	KC2AZ	9202 V
N2GDV	Niebuhr	Art	Lockwood	NY	KC2AZ	9204 Q
KB2GLO	Kenney	Thomas	Toms River	NJ	NN2Z	9112 Q
N1GMC	Cooley	Dr. Edmond	Etna	NH	W1FYR	9111 Q
W6GO	Obrien	Jay	Reo Linda	CA	FILL	9112 Q
KA1GOZ	Dillaby	Donald	Nashua	NH	KA1GOZ	9202 Q
N1GUJ	Ferguson	Peter	Granby	MA	W1NY	9108 Q
NP2H	Ovad	David	Blairstown	NJ	N2ELC	9110 V
N1HFF	Swanburg	Lloyd	Atkinson	NH	WB1DSW	9108 Q
KC1HH	Merril	Robert	Goffstown	NH	WB1DSW	9303 Q
W1HJF	Rappaport	Larry	Colebrook	NH	UNK	9202 Q
WA1HJR	Leach	Leonard	Hudson	NH	KA1GOZ	9204 Q
N1HKK	Csernelabics	Nick	Portsmouth	NH	WB1DSW	9111 Q
KB2HNJ	Karpinsky	Chris	Otego	NY	W2RGI	9203 Q
K2HNW	Goble	Alfred	Schenectady	NY	WA2UMX	9201 Q
N1HPL	Robinson	Scott	Tyngsboro	MA	WA1PHY	9107 V
N1HPN	Holmer	Jan	Acton	MA	-	9108 S
KB5HPN	Gorman	John	Vestal	NY	WF2A	9204 Q
KB2HPU	Brayman	Peter	Unadilla	NY	W2RGI	9205 Q
KA1HQH	Morrissey	Phil	Summit	NY	WA2UMX	9105 Q
N1HSM	Graziano	Stan	Portsmouth	NH	WB1DSW	9111 Q
KC1I	George	Larry	Sanford	ME	WB1DSW	9203 Q
KK2I	Oldenburg	Todd	Tonawanda	NY	-	9112 V
W3IAG	Heavener	Robert	Erie	PA	NM3G	9111 Q
N2IDK	Wright	Michelle	E. Freetown	NY	W2RGI	9105 V
W2IH	Hathaway	Ike	Syracuse	NY	WA2TVE	9204 V
N2IJM	Phillips	Phil	Geneva	NY	WB2WXQ	9201 Q
N2IJW	Baltradis	Pete	Potsdam	NY	KA2JXI	9106 Q
W2IMK	Centanni	Jim	Fairport	NY	WB2WXQ	9205 Q
N1IOF	Siegel	Shep	Derry	NH	N11GAL	9205 V
N2IRZ	Rotolo	Don	RiverDale	NJ	KD6TH	9205 V
W2IRZ	Preston	Mae	Massena	NY	KA2JXI	9111 Q
N2ITR	Fernandez	Manuel	Ogdensburg	NY	KA2JXI	9111 Q
N2IUL	Syvertsen	Einar	Albany	NY	WA2UMX	9201 Q
N1IUP	Read	Harold	Berlin	MA	-	9205 V
KC2IV	Phillips	Bob	Midl Grove	NY	WA2UMX	9203 Q
WB3IWY	Engman	Gerald	Warren	PA	KA3SFC	9111 Q
N2IZU	Harris	Russell	Webster	NY	WB2WXQ	9105 V
N2JAW	Raposo	Ron	Holland Ptnt	NY	WA2TVE	9105 Q
N2JC	Collinsworth	James	Jodus Point	NY	WB2WXQ	9105 V
W1JFP	Stiles	Calvin	Hanover	NH	W1FYR	9301 V
N2JHJ	Svalland	Eric	Kingston	NY	WB2COY	9203 V
N2JJV	King	Kenneth	Cobleskill	NY	-	9205 Q
WB2JLR	Place	Richard	Canandigua	NY	-	9302 V
KA2JXI	Ousterhout	Roger	Ogdensburg	NY	KA2JXI	9110 Q
W1JY	Johnson	O.W.H.	Bristol	NH	WA1FHB	9202 S
N2JYG	Werren	Franklin	Sherman	NY	WA0PTV	9205 V
WE2K	Schnitchler	Melvin	Binghamton	NY	WF2A	9105 Q

Continued on Page 38

Roster from page 37

callsign	*last name*	*first*	*city*	*state*	*home BBS*	*exp mem*
WN2K	Brayman Unatego RC		Otego	NY	W2RGI	9112 Q
N2KNV	Jansen	Lew	Ithaca	NY	KC2AZ	9111 Q
N2KOP	Perkins	Clint	Ithaca	NY	-	9203 Q
N2KPR	Kennedy	Terry	Milford	NY	W2RGI	9204 V
KB2KRB	Savini	Paul	Amherst	NY	W2SEX	9204 Q
N2KTM	Faux	Dr James	Brockport	NY	-	9201 V
N2KXS	Stonehill	Judith	Honeoye Fls	NY	-	9205 V
KZ2L	Coyne	Ken	Pine Island	NY	WA2RKN	9106 Q
KK4L	Dresser	Ken	Johnson City	NY	KK4L	9205 V
G8LCK	Reynolds	Lee	Greenville	NH	KB4N	9202 Q
K1LEC	Aldrich	Roland	Springfield	VT	WA1WOK	9112 Q
N2LIB	Reynolds	George	Penfield	NJ	-	9111 Q
K2LSX	Gubernard	John	Bergenfeield	NJ	W2FMN	9106 Q
K1LT	Kean	Victor	Columbus	OH	W8CQK	9107 Q
K8LT	Grebus	Gary	Brookline	NH	WA1PHY	9112 Q
W1LTC	Nobrega	Julio	Burlington	MA	-	9111 Q
N2LTI	Gauvin	Hervey	Penfield	NY	-	9203 Q
KC3LV	Seppala	E J	Fairvieee	PA	NM3G	9203 Q
WA3LWR	Chimel	Robert	Clarks Sumit	PA	K3RLI	9202 Q
WB8LYJ	Townsend	Joseph	Painesville	OH	WA8BXN	9107 Q
K3LZ	Zuckerman	Larry	Easton	PA	-	9107 Q
KY1M	Howe	Dexter	Bradford	NH	WA1WOK	9203 V
N2MAH	Gehret	Reg	Bath	NY	KC2AZ	9205 Q
K1MEA	Wzorek	James	Easthmapton	MA	K1MEA	9111 V
KA1MF	Hughes	Don	Harvard	MA	WA1PHY	9112 Q
N2MGI	Parker	Matt	Colton	NY	WB2JXI	9203 V
KC1MJ	Blowney	John	York Harbor	ME	WB1DSW	9111 Q
KA1MLN	Jolda	Joseph	Webster	MA	K1MUJ	9111 Q
WA2MNM	Fedder	William	Sanbron	NY	UNK	9212 Q
WB2MTJ	Baker	Jim	West Monroe	NY	-	9108 Q
VE3MX	Kramer	Ron	Port Colborn	ON	VE3SNP	9205 V
KA2MYD	Mathewson	Thomas	Norwich	NY	KA2MYD	9108 V
WA2MZF	Prentice	James	Canton	NY	KA2JXI	9111 S
KF2N	Dietrich	Harry	Elmira	NY	KC2AZ	9204 Q
NR1N	Collins	Lindsay	Washington	NH	WA1WOK	9212 V
W4NBC	Smith	Earl	York	ME	WB1DSW	9204 Q
N0NDO	Painter	John	NoKansas Cty	KS	-	9204 V
W1NMQ	Boudreau	Joseph	Fiskdale	MA	W1BIM	9203 V
VE3NUU	Meth	Eric	Scarboro	ON	VE3NUU	9111 V
WB2NVR	Schaps	Robert	Scarsdale	NY	WB2QJA	9204 Q
KA1NZA	Handley	Eric	N.Clarendon	VT	KA1NZA	9110 Q
WJ2O	Farnsworth	Dave	McConlesvill	NY	-	9106 V
AD3O	Voorhees	Denny	Savre	PA	KC2AZ	9204 V
NX9O	McCarthy	Brian	Vestal	NY	WF2A	9302 V
KA3ODJ	Horn	Andy	Bangor	PA	N3ET	9108 Q
WA1OJB	Glassbrook	Robert	Bowdoinham	ME	WA1OJB	9106 Q
KA2OMQ	Calvete	Thomas	Rochester	NY	WB2WXQ	9107 S
KC1OR	Guro	Roy	Springfield	MA	K1MEA	9204 Q
KA1OU	Eddy	Chan	Concord	NH	WA1WOK	9105 V
KB1OZ	Sinclair	Ronald	Epping	NH	WB1DSW	9106 V
NG2P	Hunter	Bob	Rochester	NY	WB2WXQ	9205 V
NX2P	Slack	Bill	Sparta	NJ	N2ELC	9205 V
KA3PGW	Weirbach	Ken	Bethleham	PA	-	9107 Q
KB1PJ	Speltz	David	Arlington	MA	KB1PJ	9105 V
KC1PK	Ames	Thomas	Beverly Frms	MA	WB1DSW	9201 V
WA1PTC	Staines	Michael	Rochester	NH	KA1NNN	9205 V
WB2PTX	Castellano	Cosmo	New Hartford	NY	WA2TVE	9108 Q
WB8PUF	Burningham	John	Mahopag	NY	-	9204 V
VE2PWI	West Isle ARC		Dorval	QU	VE2FKB	9203 Q
NK1Q	Cedrone	Jim	S. Boston	MA	WB1AES	9105 V

callsign	*last name*	*first*	*city*	*state*	*home BBS*	*exp mem*
WB2QBQ	Seger	Robert	Altamont	NY	WA2UMX	9204 V
KA1QP	Chauvin	Paul	Manchester	NH	WA1WOK	9201 Q
KA2QYE	Frisone	Frank	Schenectady	NY	-	9105 Q
KD1R	Stetson	Ralph	Westford	VT	KD1R	9202 Q
KA2RAF	Crosby	Chris	Lakewood	NJ	NN2Z	9105 Q
W1RFP	Pratt	Blanchard	Norwich	VT	W1FYR	9108 Q
VE3RM	Dashney	Don	LOrignal	ON	VE2FKB	9203 Q
W1RNZ	Stearns	Gordon	N. Sprgfield	VT	WA1FHB	9201 Q
WB2RRW	Simons	James	Houghton	NY	KA2TFC	9205 V
WA2RZG	White	Jack	Scottsville	NY	WB2WXQ	9106 Q
KC1SB	Boyle	Joseph	E. Rochester	NH	-	9106 Q
KA3SFC	Ellsworth	Lloyd	Warren	PA	KA3SFC	9111 V
KA1SIE	Garon	Chris	Nahsua	NH	KA1GOZ	9204 Q
K4SJ	Anderson	Philip	Perry	NY	WB2WXQ	9205 Q
WA2SOK	Walter	Irv	Palmyra	NY	WA2WXQ	9111 V
KA1SYF	Knight	Frank	New Gloucesr	ME	KA1NNN	9106 Q
WA3T	Moseley	Robin	Allentown	PA	-	9110 Q
KA1TDL	Warren	Schley	Chicopee	MA	K1MEA	9204 Q
KA8TEF	Frazier	Phil	Republic	OH	N8FIS	9111 Q
KA2TFC	Montgomery	John	Little Vally	NY	KA2TFC	9111 V
KA1THM	Vangel	Mathew	Mattapoisete	MA	KA1THM	9107 Q
WA1THQ	Garrison	Karen	Durham	NH	WB1DSW	9105 Q
WA1TLN	McAllister	Russell	Lebanon	NH	WA1FHB	9202 Q
DK1TM	Malner	Juergen	Westfield	MA	-	9203 Q
K2TNN	Batik	Jerome	Stamford	NY	W2RGI	9105 Q
KA1TOW	Pigott	Bruce	Bedford	MA	WA1PHY	9105 V
KE2TP	Perley	Don	Troy	NY	WA2UMX	9112 V
K1TR	Parsons	Ed	Windham	NH	KA1PEP	9201 Q
WA2TVE	Cohen	Howie	Utica	NY	WA2TVE	9112 V
N2UA	Varga	Thomas	Methuen	MA	KA1MGO	9202 Q
K1UAQ	Sencabaugh	William	Littleton	NH	K1UAQ	9202 Q
W1UBG	King	Robert	Dover	NH	WB1DSW	9202 V
KA1UDX	Bogdan	Rick	Hull	MA	NS1N	9107 Q
K1UGM	Morris	Jim	Wakefield	MA	K1UGM	9111 V
WA2UKX	Reiter	William	Pen Yan	NY	WB2WXQ	9205 Q
WA2UMH	McKnight	Jim	Schuylervile	NY	WA2UMX	9202 V
K2UOB	Weiman	Don	Almond	NY	-	9107 V
KB7UV	Funk	Andrew	Astoria	NY	KD6TH	9204 Q
WD1V	Seney	John	Manchester	NH	KB4N	9203 Q
WA2VAM	Wright	Kevin	E. Freetown	NY	W2RGI	9302 V
WA2VEZ	Scanandoah	Alan	Hornell	NY	KC2AZ	9205 Q
W1VGZ	Dimilla Jr	Thomas	Saugus	MA	K1UGM	9201 Q
WB2VPH	Lievense	Richard	Brockport	NY	WB2WXQ	9203 Q
KC2VS	Reichert	Leigh	Williamsvill	NY	-	9111 Q
AI2W	Dombert	Ed	Hornell	NY	KC1AZ	9106 Q
KV2W	White	James	Hammondsport	NY	WB2GZE	9107 Q
KA1WHE	Douillard	Ronald	Chicopee	MA	K1MEA	9110 V
KA1WHV	Britton	Mike	Mill River	MA	-	9203 V
WA2WNI	Jonas	Dana	Valatie	NY	WA2PVV	9211 V
K1WNZ	Stuart	David	Dover	NH	WB1DSW	9111 V
WB7WOG	Neff	Neal	Stoneham	MA	K1UGM	9107 Q
KA2WPT	Stinner	Theodore	Holland	NY	KA2MZC	9205 Q
K1YHR	Packard	David	Pennellville	NY	-	9107 V
KB2YJ	Zanghi	Gary	Angola	NY	WA0PTV	9205 V
WA3YML	McCambridge	Michael	Moscow	PA	K3RLI	9204 Q
KB7YW	Peachman	Fred	Brookfield	OH	WA8LVP	9205 Q
KA0ZCY	Khoury	John	Utica	NY	WA2TVE	9201 V
K1ZDS	Sonsoucie	Barry	Dover	NH	WB1DSW	9203 Q
KA2ZMC	Sumski	Paul	Arcade	NY	-	9108 Q
WB2ZUF	McCoy	Glenn	Nichols	NY	WB2ZUF	9204 Q
NONE	Dalton	Howard	Amesbury	MA	-	9105 Q

Membership Roster prepared by WB1DSW — Membership Director

TheNET Sysop's Help Sheet

	Parm # for version			PROM Defaults		NEDA NRS Defaults		
Parameter Function	v1.1	v1.16	TN2.08	User	Bkbn	User	Bkbn	Gateway
Minimum Quality For Auto Update	2		1	50	50	50	50	50
HDLC Channel Quality	3		2	50	58	50	230	50
RS-232 Channel Quality	4		3	230	58	230	230	230
Obsolescence Count Init Value	5		4	3	3	3	3	3
Obsolescence Count Min For Broadcast	6		5	4	1	4	1	4
Nodes Broadcast Interval (sec)	7		6	1800	1800	1800	1800	1800
FRACK (sec)	18		7	6	1	3-6	1	1
MAXframe	19		8	1	1	1	1	1
Link RETRIES	20		9	10	10	8↑	10	10
Digipeating 0=no; 1=yes	23		10	0	0	0	0	0
Validate Callsigns 0=no; 1=yes	24		11	1	1	1	1	1
Host Mode Connects	na		12	0	0	0	0	0
TxDELAY (10ms)	na		13	35	35	35	custm	custm
Broadcast Via Port b0=radio; b1=RS-232	na		14	2	3	2	3	3
Point Node Propagate 0=no; 1=yes	na		15	0	0	0	0	0
Connect Command Enable 0=no; 1=yes	na		16	1	1	1	0	1
Destination List Length	1		17	100	100	100	100	100
Time-to-live Initializer (hops)	8		18	18	18	18	18	18
Transport Timeout (sec)	9		[19]	300	300	300	300	300
Transport RETRIES	10		[20]	2	2	2	2	2
Transport ACK Delay (sec)	11		[21]	1	1	1	1	1
Transport Busy Delay (sec)	12		[22]	180	180	180	180	180
Transport Window Size	13		[23]	4	4	4	4	4
Congestion Control Threshold	14		[24]	4	4	4	4	4
No-Activity Timeout (sec)	15		[25]	7200	7200	7200	7200	7200
P-persistance (see text)	16		[26]	64	255	64	255	255
Slot Time (10ms)	17		[27]	35	1	35	1	1
Link RESPTIME [t2 timeout] (10ms)	21		[28]	75	20	75	20	20
Link T3 Timeout [CHECK] (10ms)	22		[29]	65000	65000	65000	65000	65000
Station ID 0=msgs;1=after; 2=always	25		[30]	1	0	1	0	0
CQ Broadcasts 0=no; 1=yes	26		[31]	1	0	1	0	0
Heard List Length	na		[32]	20	20	20	20	20
Full Duplex 0=no; 1=yes	na		[33]	0	0	0	0	

Gateway Construction

To construct a gateway, parameters must be set as shown. In addition the node being gatewayed to must be locked in as a node by the following command:

N callsign + node 50 0 0 callsign

At each of the other nodes in the node stack of your gateway port the route to the gateway port must be locked to 0 using the command:

R 1 callsign + 0

The gateway port must be locked in at least one of the other nodes in your node stack. Performing these various locks prevents any potential abuse of the NEDA network by outside users or sysops. The specific abuse would be that of locking in NEDA nodes at the outside node with a route towards the gateway node.

There are certain parms and configurations in a gateway TNC that are like a user port and other parms and configurations that are like a backbone port.

This kind of gateway is what is in use between SRTOGA and ALBANY and between ICRC07 and BERK. The nodenames on each end are visible. Stations must connect directly to the node on the far side of the gateway from where they are starting. Using the parms presented above on both sides of the gateway will force users to connect to the nodes on both sides of the gateway before proceeding.

The parms listed above as PROM defaults for backbone nodes will cause a different type of gateway to exist in which the user ports at the multiport nodes on each side will show up at the user port on the other side. It is important to note, however, that the node op on either side can cheat the gateway by locking in nodes on the other side that aren't propagated automatically. Thus that 'gateway' is only a gateway if the sysops agree not to cheat. The first example is impervious to such cheating.

The reason that the PROM defaults are set for gateway style operation is that it is up to the NRS to enable a backbone link in the NEDA network. If a node op installs a prom burned with these defaults the backbone will be a gateway until the NRS sysops it.

Propagation Values

Quality values at each node allong a broadcast sequence.

This node:	256, 230
2nd node:	207, 186
3rd node:	167, 150
4th node:	135, 121
5th node:	109, 98
6th node:	88, 79
7th node:	71, 64
8th node:	58, 52

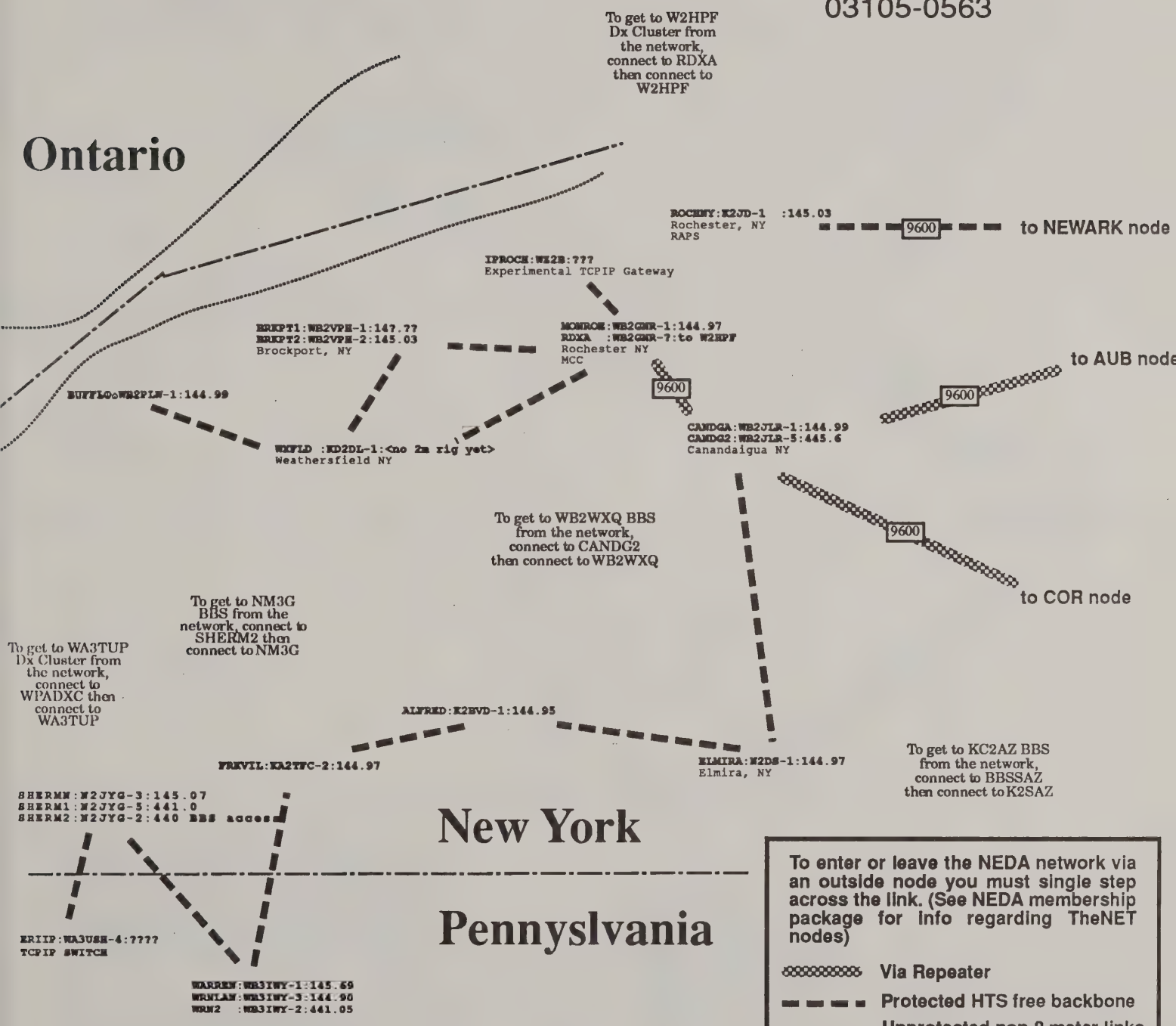
—KA2DEW
—NEDA editor

North East Digital Association

Western New York Region **user** port map

rev 1.33 5/23/91

NEDA
Box 563
Manchester, NH
03105-0563



NEDA nodes are:
BUFFLO BRKPT WXFLD CANDGA MONROE ELMIRA ALFRED FRKVIL WARREN SHERMN ROCHNY

To enter or leave the NEDA network via an outside node you must single step across the link. (See NEDA membership package for info regarding TheNET nodes)

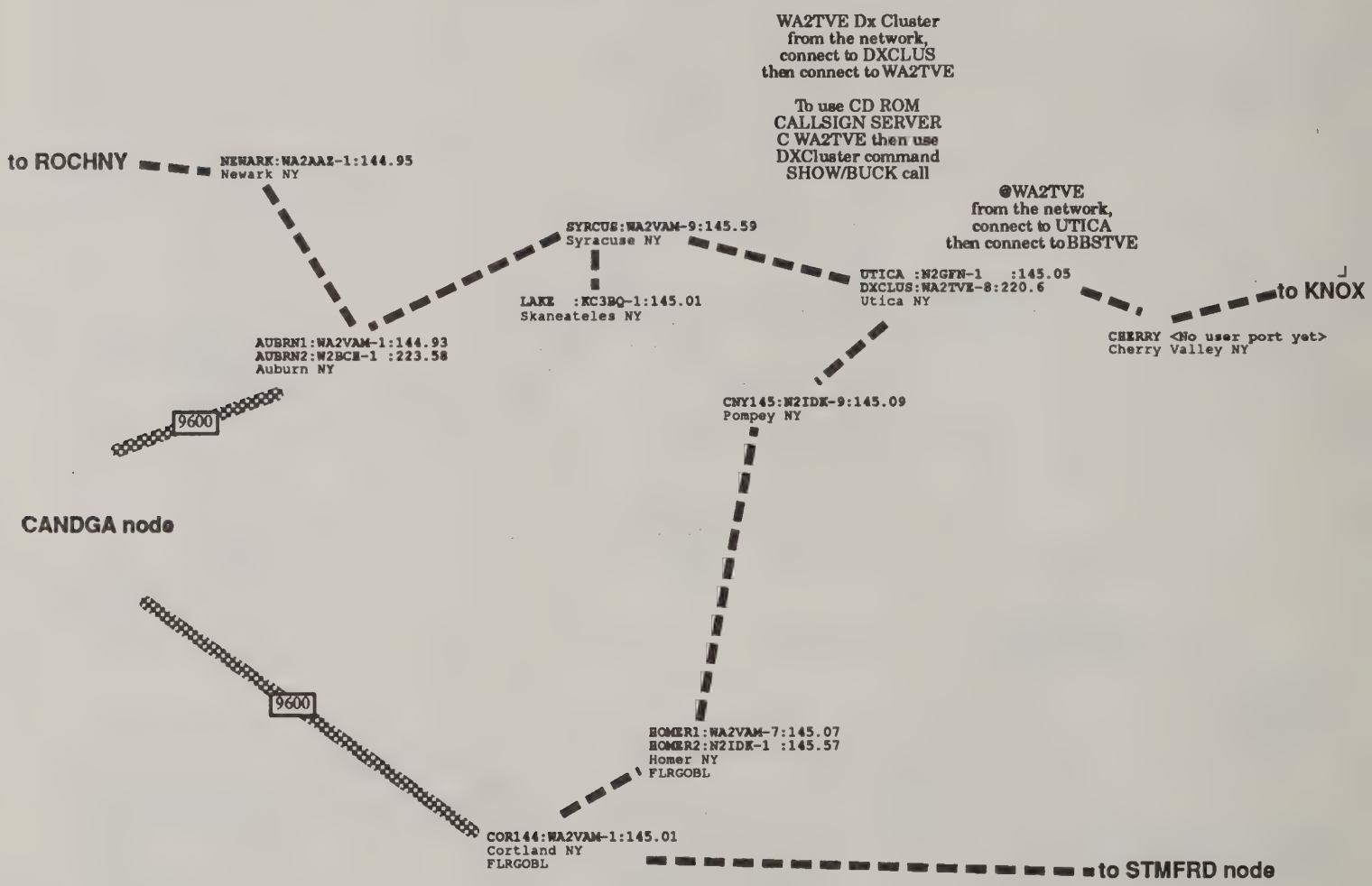
- Via Repeater
- Protected HTS free backbone
- Unprotected non 2 meter links
- 2400 — Denotes baud rate of link, 1200 if not shown

North East Digital Association

Central New York Region **user** port map

rev 1.33 5/23/91

NEDA
Box 563
Manchester, NH
03105-0563



NEDA nodes are:
NEWARK AUB SYR HOM
COR LAKE CNY UTICA

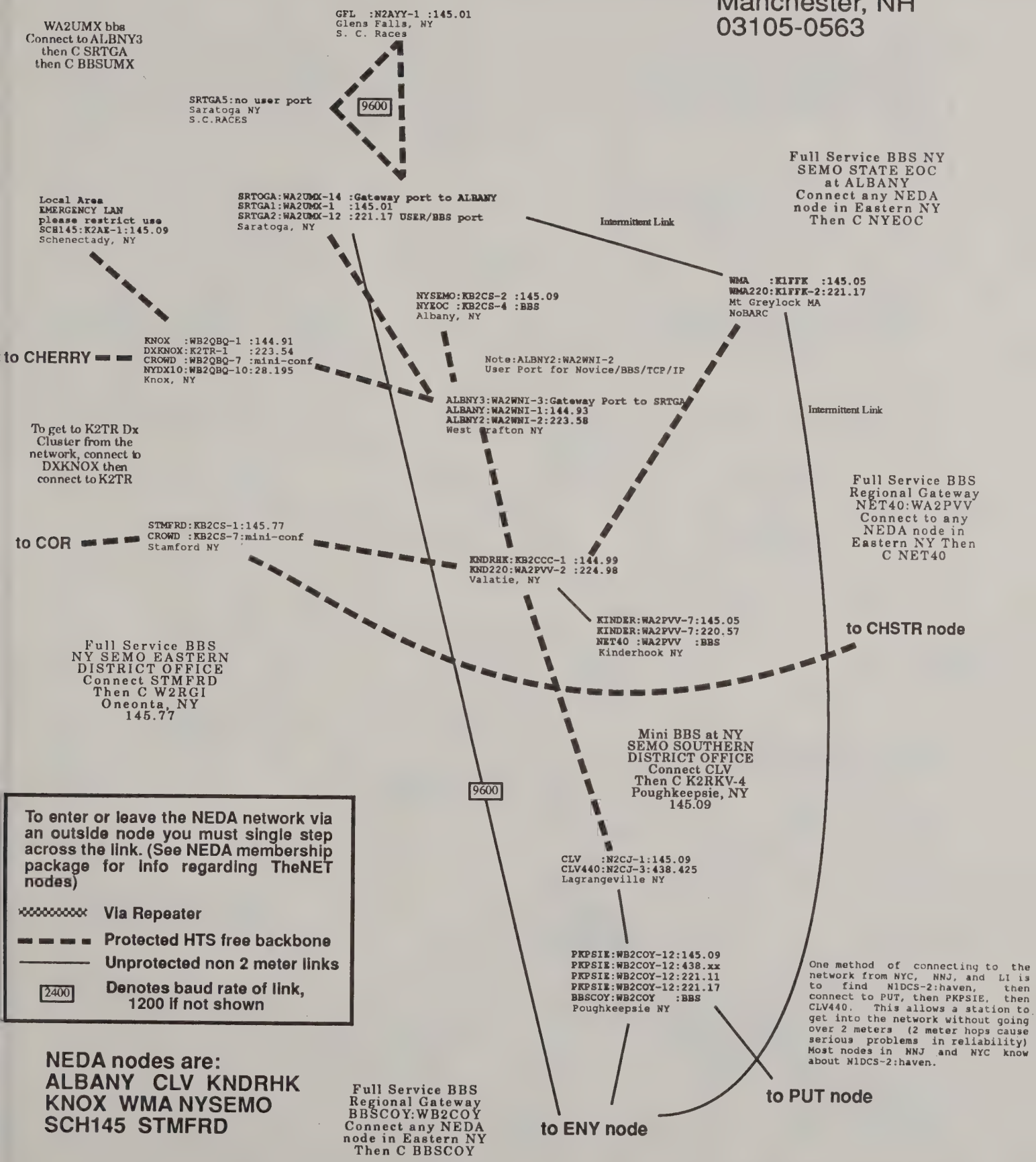
To enter or leave the NEDA network via an outside node you must single step across the link. (See NEDA membership package for info regarding TheNET nodes)

- Via Repeater
- Protected HTS free backbone
- Unprotected non 2 meter links
- 2400 — Denotes baud rate of link, 1200 if not shown

North East Digital Association

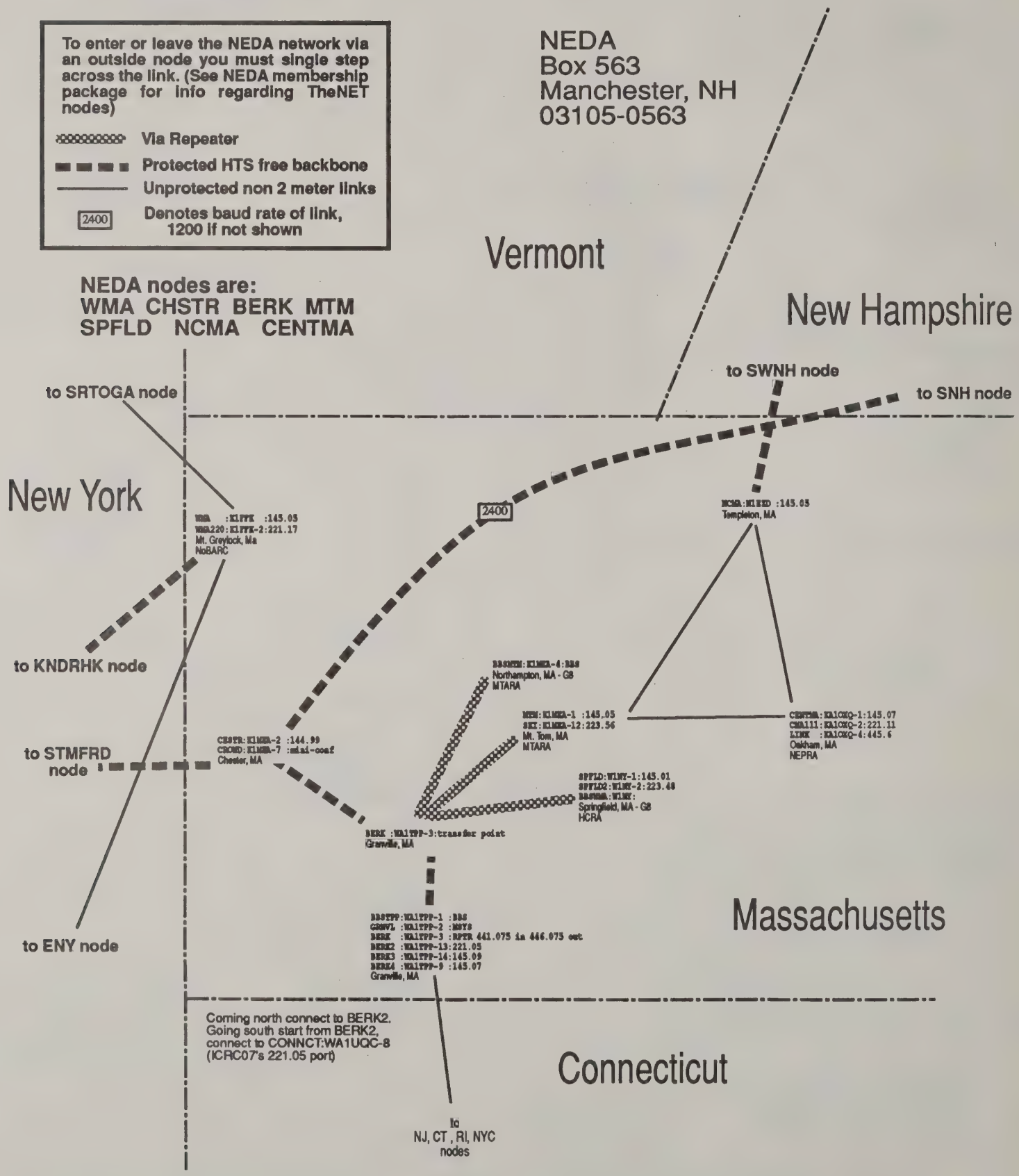
Eastern New York Region **user** port map
rev 1.33 6/4/91

NEDA
Box 563
Manchester, NH
03105-0563



North East Digital Association

VT/Western Mass/CT **user** port map
rev 1.32 5/23/91



North East Digital Association

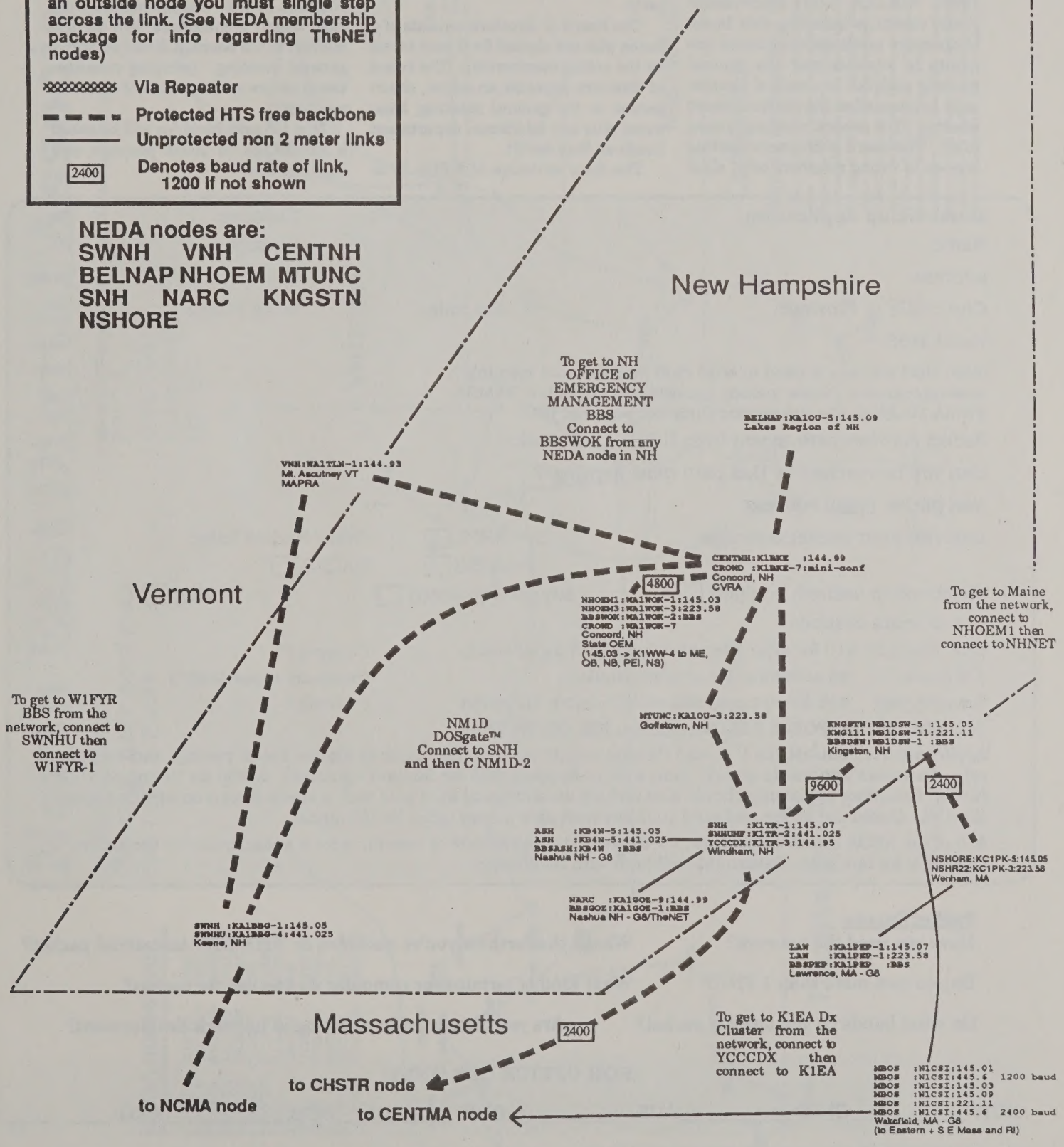
New Hampshire **user port** map
rev 1.32 5/23/91

NEDA
Box 563
Manchester, NH
03105-0563

To enter or leave the NEDA network via an outside node you must single step across the link. (See NEDA membership package for info regarding TheNET nodes)

- Via Repeater
- Protected HTS free backbone
- Unprotected non 2 meter links
- [2400] Denotes baud rate of link, 1200 if not shown

NEDA nodes are:
SWNH VNH CENTNH BELNAP NHOEM MTUNC SNH NARC KNGSTN NSHORE



North East Digital Association Membership

Welcome to packet networking. This is the official membership application form for N.E.D.A.

Some General Stuff About N.E.D.A.:

N.E.D.A. was founded on Sept. 17, 1989. N.E.D.A. holds 5 scheduled yearly meetings including four board of directors meetings announced one month in advance and one general meeting each fall in a central location to be announced at the previous board meeting. The general meeting is open to all. The board of directors meeting is open to voting members only, all of whom are invited via packet mail @ their Home BBS.

Club funds may only be allocated at the board meetings, the minutes of which are printed in the NEDA Quarterly.

The board of directors consists of 6 hams who are elected for 2 year terms by the voting membership. The board of directors appoints an editor, chairperson to the general meeting, treasurer plus any additional department heads as they see fit.

The dues structure of NEDA is as follows:

Associate network support membership is $10. Associate network support membership with quarterly updates is $15. Voting membership in N.E.D.A. is $25. Voting members decide which 3 members will be appointed to the board of directors at the general meeting. (pending constitutional review at July board of directors meeting)

Non US memberships will be asked a surcharge to cover postage and banking fees.

Membership Application

Callsign:

Name:

County:

address:

Home Phone:

City, State or Province: Zip code: Work Phone:

Home BBS:

Note: BBS address is used to send club bulletins and meeting announcements. Please include hierarchal address (i.e. K1MEA.#WMA.MA.USA) of a full service BBS, not personal PMS.

Packet connect path to you from N.E.D.A. network:

Can you be reached by this path most evenings?

Non packet email address:

Describe your packet activities: ARRL ☐ Other Radio Clubs:

ARES ☐ RACES ☐

Membership desired: support ☐ support+quarterly ☐ voting ☐

# of years desired:

Send check for $10 for associate network support membership **("support").**

(US funds) $5 additional for quarterly update. **("support + quarterly")**

(for each year $25 for voting membership(includes quarterly) **("voting")**

desired) to: **NEDA, POBox 563, Manchester NH, 03105-0563**

Applicants from outside the U.S. and Canada should write to the POBox to inquire about postage and exchange rate. Canadian applicants should remit $15 for Support, $20 for Support+Quarterly or $30 for Voting, in U.S. funds. Canadian applicants should also include an additional $5 if paid with a check drawn on any Canadian account. (Avoid the $5 fee and send your payment as a money order for US funds)

$10 of the NEDA membership dues, for the year starting at date of receipt, is for a subscription to the NEDA Quarterly for one year. Return this bill form with remittance.

Packet Survey

Have you used the network? What's the furthest you've packeted on VHF/UHF terrestrial packet?

Do you own more than 1 TNC? What kind of terminal or computer do you use for packet?

On what bands do you operate packet? Are you interested in assisting in network development?

FOR OFFICE USE ONLY:

RCT: _____ CNO: _____ ACK: _____ DDP: _____ DOE: _____ PKG: _____

North East Digital Association

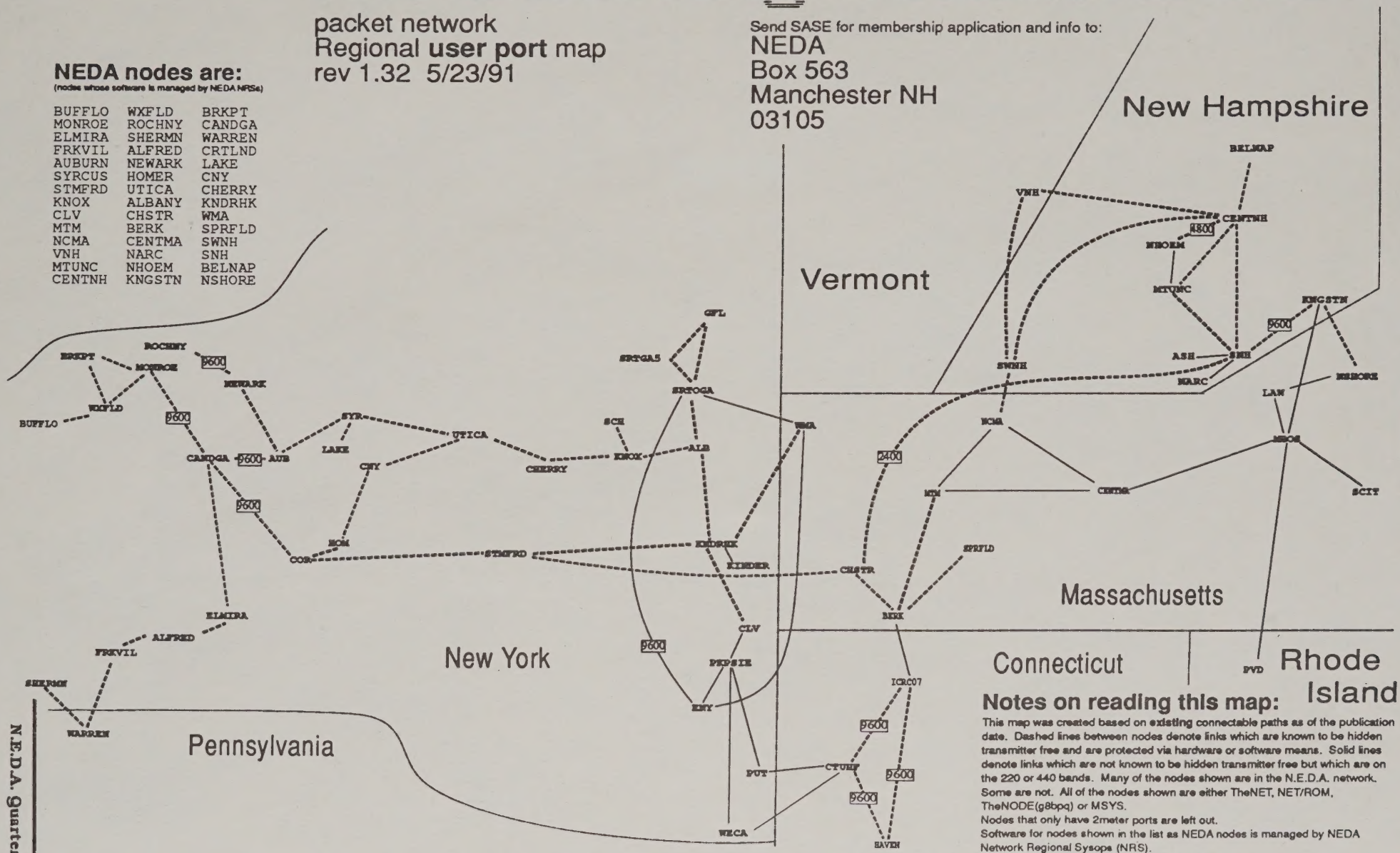
packet network
Regional **user port** map
rev 1.32 5/23/91

Send SASE for membership application and info to:
NEDA
Box 563
Manchester NH
03105

NEDA nodes are:

(nodes whose software is managed by NEDA NRSs)

BUFFLO	WXFLD	BRKPT
MONROE	ROCHNY	CANDGA
ELMIRA	SHERMN	WARREN
FRKVIL	ALFRED	CRTLND
AUBURN	NEWARK	LAKE
SYRCUS	HOMER	CNY
STMFRD	UTICA	CHERRY
KNOX	ALBANY	KNDRHK
CLV	CHSTR	WMA
MTM	BERK	SPRFLD
NCMA	CENTMA	SWNH
VNH	NARC	SNH
MTUNC	NHOEM	BELNAP
CENTNH	KNGSTN	NSHORE



Notes on reading this map:

This map was created based on existing connectable paths as of the publication date. Dashed lines between nodes denote links which are known to be hidden transmitter free and are protected via hardware or software means. Solid lines denote links which are not known to be hidden transmitter free but which are on the 220 or 440 bands. Many of the nodes shown are in the N.E.D.A. network. Some are not. All of the nodes shown are either TheNET, NET/ROM, TheNODE(g8bpq) or MSYS.

Nodes that only have 2meter ports are left out.

Software for nodes shown in the list as NEDA nodes is managed by NEDA Network Regional Sysops (NRS).

All links are 1200 baud unless otherwise indicated.

Maps showing more detail (including callsigns, frequencies, full node name list and town) in a multiple page format are available with membership to NEDA.

Send corrections and new information to NEDA @ W1NY, attn: Maps

The NEDA Quarterly is the official journal of the North East Digital Association. It is published four times annually. Distribution is around 500 copies including paid members and public relations purposes. Membership at the time of publication was 244.

A membership form is included in this package.

NEDA is a non-profit club formed for the purpose of promoting free access general purpose amateur radio packet networking. NEDA's primary geographic region of interest is ONT, OH, PA, NY, NJ, QUE, CT, RI, MA, VT, NH, ME, NB, NS, PEI. Currently the club has member owned hardware in a cooperative, backbone supported network, in Pennsylvania, New York, Massachusetts, Vermont, and New Hampshire.

NEDA holds at least 4 board of director meetings each year. The minutes of those meetings are printed in the Quarterly. NEDA's board of directors consist of six individuals who are elected for alternating two year terms. Three directors are elected each year at the general meeting each fall. Nominations are automatic for those voting members who are paid 2 years in advance and who have attended half of the preceding year's board meetings.

North East Digital Association
Box 563
Manchester NH 03105
USA